#### SUMMARY OF BOARD ITEM

ITEM # 01-8-4:

PUBLIC HEARING TO CONSIDER THE ADOPTION AND AMENDMENT OF VAPOR RECOVERY SYSTEM CERTIFICATION AND TEST PROCEDURES

STAFF RECOMMENDATION:

The staff recommends that the Air Resources Board (ARB or Board) adopt proposed amendments to the vapor recovery certification and test procedures and the regulations which incorporate these procedures into the California Code of Regulations.

**DISCUSSION:** 

State law authorizes the Board to adopt procedures for certifying systems to control gasoline vapor emissions from gasoline dispensing facilities (service stations). To ensure statewide uniformity, districts are required to use ARB adopted test procedures to make compliance determinations for in-use vapor recovery systems. Last year, the Board approved the enhanced vapor recovery (EVR) regulations to correct problems found with in-use vapor recovery systems and to obtain additional emission reductions.

The EVR regulations have resulted in new vapor recovery equipment and system designs. During the certification process, staff found that some existing test procedures were not applicable and developed new performance specifications and certification and compliance test procedures. The California Air Pollution Control Officers Association (CAPCOA) requested expansion of the applicability of one test procedure and a shorter abbreviated test procedure for compliance determination. In response, staff is proposing to modify four existing procedures (including the definition list) and to add three new test procedures.

During the development of the proposed amendments staff had numerous conversations with various stakeholders. A workshop was held

on June 20, 2001 to discuss the proposed amendments. After the workshop, further revisions to the certification and test procedures were posted on the ARB web page to solicit additional stakeholder comments. Stakeholders include districts, equipment manufacturers, petroleum marketing associations, oil companies, gasoline dispensing facility operators, vapor recovery equipment distributors, and vapor recovery testing organizations.

## **SUMMARY AND IMPACTS:**

The proposal will not change existing performance standards and thus, will not affect current certification of vapor recovery systems and will not result in decertification of existing systems. The proposed changes will not impose unreasonable cost burdens. No emissions reductions are claimed with these proposed amendments.

#### TITLE 17. CALIFORNIA AIR RESOURCES BOARD

# NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION AND AMENDMENT TO THE VAPOR RECOVERY CERTIFICATION AND TEST PROCEDURE REGULATIONS FOR VAPOR RECOVERY

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adoption and amendment to the regulations for certification and testing of vapor recovery systems installed at gasoline dispensing facilities (service stations and similar facilities).

DATE:

October 25, 2001

TIME:

9:00 a.m.

PLACE:

Monterey Bay Unified Air Pollution Control District

Board Room, 3rd Floor 24580 Silver Cloud Court Monterey, CA 93940

This item will be considered at a two-day meeting of the ARB, which will commence at 9:00 a.m., October 25, 2001, and may continue at 8:30 a.m., October 26, 2001. This item may not be considered until October 26, 2001. Please consult the agenda for the meeting, which will be available at least 10 days before October 25, 2001, to determine the day on which this item will be considered.

This facility is accessible to persons with disabilities. If accommodation is needed, please contact the Clerk of the Board at (916) 322-5594, or Telephone Device for the Deaf (TDD) (916) 324-9531 or (800) 700-8326 for TDD calls from outside the Sacramento area, by October 10, 2001, to ensure accommodation.

# INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

#### **Sections Affected**

Proposed amendments to sections 94010, 94011, 94153, 94155 and 94163, title 17, California Code of Regulations (CCR) and the procedures incorporated by reference therein. Proposed adoption of new sections 94164 and 94165, title 17, CCR, and the procedures incorporated by reference therein.

## Background

Health and Safety Code (H&SC) section 41954 requires the Board to adopt procedures and performance standards for controlling gasoline vapor emissions from gasoline marketing operations, including storage and transfer operations, to achieve and

maintain ambient air quality standards. Section 39607(d) of the Health and Safety Code requires ARB to adopt test methods to determine compliance with ARB and district non-vehicular emissions standards. The adopted vapor recovery certification and test procedures are referenced in sections 94010-94015, title 17, CCR. ARB vapor recovery test procedures, as referenced in sections 94101-94163, title 17, CCR, are used by districts for compliance determination of in-use vapor recovery systems.

Under state law responsibilities for controlling emissions from gasoline dispensing facilities (service stations) are shared between the Board and districts. The Board is responsible for certifying vapor recovery system for gasoline dispensing facilities to ensure that all certified systems meet a certain level of emissions control performance, and to establish performance standards and test procedures by which districts can verify that in-use systems are operating properly. Districts are responsible for determining whether vapor recovery is needed to attain or maintain ambient air quality standards. The ARB has determined that vapor recovery is required for high throughput gasoline dispensing facilities (service stations) to reduce public exposure to benzene, a toxic air contaminant. When vapor recovery is required, districts must permit gasoline dispensing facilities (service stations) with vapor recovery systems that are certified by the ARB. Additionally, districts are responsible for verifying that in-use vapor recovery systems comply with the performance standards or specifications established by the Board during the certification process.

Since 1975, the ARB has adopted certification and test procedures for vapor recovery systems for gasoline dispensing facilities. These procedures require vapor recovery equipment manufacturers to demonstrate compliance with the applicable performance standards or specifications through operational and performance testing. The Board on March 23, 2000 approved the enhanced vapor recovery (EVR) regulations, which represented substantial change to the vapor recovery certification program. The purpose of EVR was to seek additional emission reductions by increasing the stringency of performance standards and specifications, to improve the certification process by increasing the performance and reliability of vapor recovery equipment, and to re-evaluate currently certified systems. These new requirements will be phased in over the next several years to promote an orderly transition.

#### **Need for Amendment and Adoption**

With the implementation of the new EVR regulations, as new designs and systems have been evaluated, the need for new, more specific performance specifications has arisen. During the certification process staff develops the new specifications and test procedures. Incorporating the new specifications and test procedures into the certification procedure ensures that the requirements are applicable to new certifications. In addition, the California Air Pollution Control Officers Association (CAPCOA) has requested modification to two test procedures to expand their applicability and to simplify them. By continuing to update the vapor recovery certification and test procedures, the ARB improves the vapor recovery system certification process.

# **Summary of Staff Proposal**

ARB staff proposes to revise the following certification and test procedures and to amend title 17, CCR, sections 94010, 94011, 94153, 94155 and 94163, which incorporate the procedures by reference. The amended procedures are:

- D-200 Definitions for Vapor Recovery Procedures, as last amended February 1, 2001
- CP-201 Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities, as last amended July 25, 2001
- TP-201.1D Pressure Integrity of Drop Tube Overfill Protection Devices, as adopted February 1, 2001
- TP-201.4 Dynamic Back Pressure, as last amended April 28, 2000
- TP-201.6C Compliance Determination of Liquid Removal Rate as proposed for adoption September 7, 2001

ARB staff proposes that the Board adopt sections 94164 and 94165, title 17, CCR, which incorporate the following two new procedures by reference:

- TP-201.1B Static Torque of Rotatable Phase I Adaptors, as proposed for adoption September 7, 2001
- TP-201.1C Pressure Integrity of Drop Tube/Drain Valve Assembly, as proposed for adoption September 7, 2001

The revised procedures are summarized below.

D-200 Definition for Vapor Recover Procedures

Proposed amendments include defining the term, static torque at Phase I adaptors, and clarifying the definitions for vapor guard (mini-boot), summer fuel, and winter fuel.

CP-201 Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities

CP-201 prescribes requirements for certification of the performance of gasoline dispensing facility (service station) vapor recovery systems. Staff is proposing for vapor and product rotatable adaptors a static torque of 108 pound-inch (9 pound-foot), determined by proposed TP-201.1B. Proposed TP-201.1B would also be used to verify that adaptors are capable of rotating 360 degrees. Staff is also proposing to establish cam and groove specifications for adaptors. Other changes include specifying the proposed TP-201.1C and TP-201.1D for determining the leak rate for spill containment

box drain valves and drop tube overfill protection valves. Proposed CP-201 is modified to clarify the procedure for calculating the average daily pressure in the underground storage. Staff is proposing to specify th∈ number of self-service refueling operations during certification testing for liquid retention.

# TP-201.1D Pressure Integrity of Drop Tube Overfill Protection Devices

Proposed TP-201.1D is a certification and compliance test procedures for determining the leak rate of spill containment box drain valves and overfill protection devices. When the EVR regulations were adopted TP-201.1D was incorrectly numbered as TP-201.2O. The proposed change will correct this error. The proposed procedure would provide the methodology to differentiate the leak rate between the spill containment box drain valve and the overfill protection device.

# TP-201.4 Dynamic Back Pressure

TP-201.4, originally adopted in 1996, was last amended in 2000 as a compliance and certification procedure. The test procedure is used to determine the resistance (back pressure) of dispensing equipment to the flow of vapor simulated by a nitrogen stream. The proposed amendments would expand the applicability to system configurations not previously addressed by adding methods for testing these configurations. Other changes are proposed to clarify the test procedure. The principle of the test measurement has not changed.

## TP-201.6C Compliance Determination of Liquid Removal Rate

TP-201.6C is a new, simplified compliance test procedure for measuring the removal rate of liquid removal devices used on balance vapor recovery systems. The proposed procedure represents a simplified version of TP-201.6 and would provide two options for determining the liquid removal rate. Districts will specify which options to use for compliance determination.

#### TP-201.1B Static Torque of Rotatable Phase I Adopters

TP-201.1B is a proposed new certification and compliance procedure to measure the static torque and 360 degree rotation of product and vapor adaptors used during cargo tank delivery.

# TP-201.1C Pressure Integrity of Drop Tube/Drain Valve Assembly

Staff is proposing a new certification and compliance test procedure, TP-201.1C, which would determine the leak rate of the drain valve of the spill containment box when the drop tube is installed below such a box.

The proposed regulation also contains record keeping requirements. In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the ARB's Executive Officer has found that the reporting requirements of the regulation which apply to businesses are necessary for the health, safety, and welfare of the people of the State.

# Comparable Federal Regulations

There are no comparable federal regulations that certify gasoline recovery systems for service stations; however, changes to ARB vapor recovery regulations may have a national impact. ARB certification is required by most other states, which mandate the installation of vapor recovery systems in gasoline dispensing facilities.

# **AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS**

The ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the potential environmental and economic impacts of the proposal, and supporting technical documentation. The staff report is entitled: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the Adoption and Amendment of Vapor Recovery System Certification and Test Procedures.

Copies of the ISOR and full text of the proposed regulatory language, in underline and strike-out format to allow for comparison with the existing regulations, may be obtained from the ARB's Public Information Office, Environmental Services Center, 1001 "I" Street, First Floor, Sacramento, California 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing (October 25, 2001).

Upon its completion, the Final Statement of Reason (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the web site listed below.

Inquiries concerning the substance of the proposed regulations may be directed to the designated agency contact persons: George Lew or Laura McKinney, Engineering and Certification Branch, Monitoring and Laboratory Division, at (916) 327-0900.

Further, the agency representative and designated back-up contact persons to whom non-substantive inquiries concerning the proposed administrative action may be directed are Artavia Edwards, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-6070, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

If you are a person with a disability and desire to obtain this document in an alternative format, please contact the Air Resources Board ADA Coordinator at (916) 323-4916, or TDD (916) 324-9531, or (800) 700-8326 for TDD calls from outside the Sacramento area.

This notice, the ISOR, and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at <a href="http://www.arb.ca.gov/regact/vrmth01/vrmth01.htm">http://www.arb.ca.gov/regact/vrmth01/vrmth01.htm</a>.

## COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the cost or savings necessarily incurred in reasonable compliance with the proposed regulatory action are presented below.

The Executive Officer has determined that the proposed regulatory action will not create costs or savings, as defined in Government Code section 11346.5(a)(6), to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, or other nondiscretionary savings to local agencies.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses. The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

In accordance with Government Code section 11346.5(a)(10), the Executive Officer has initially determined that the proposed amendments should not have impacts on the creation or elimination of jobs within the State of California, and should have minor impacts on the creation of new businesses and the elimination of existing businesses within the State of California, and minor impacts on the expansion of businesses currently doing business within the State of California.

As defined in Government Code section 11346.5(a)(9), the ARB is aware of cost impacts that a representative private person or business would incur in reasonable compliance with the proposed action. Costs may be incurred by gasoline dispensing equipment manufacturers, vapor recovery testers, or gasoline dispensing facilities. Overall, staff does not expect the proposed modifications to impose an unreasonable cost burden on the gasoline dispensing equipment manufacturers, the vapor recovery testers, or the gasoline dispensing facilities. In one instance, a modification to a procedure will shorten the time required to complete testing which will reduce test time and hourly labor charges. The adoption of two new procedures will slightly offset the

savings. In considering costs for equipment required to complete testing, staff believes that the test equipment costs will be minor in nature and the time savings required to complete vapor recovery testing will offset other costs. A detailed assessment of the economic impacts of the proposed amendments can be found in the ISOR.

The Board's Executive Officer has also determined that the regulation will affect small businesses.

Before taking final action on the proposed regulatory action, the ARB must determine that no reasonable alternative considered by the ARB or that has otherwise been identified and brought to the attention of the ARB would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons or businesses than the proposed action.

# SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing, or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received by no later than 12:00 noon October 24, 2001, and addressed to the following:

Postal Mail is to be sent to:

Clerk of the Board Air Resources Board 1001 "I" Street, 23<sup>rd</sup> Floor Sacramento, California 95814

Electronic mail is to be sent to: <u>vrmth01@listserv.arb.ca.gov</u> and received at the ARB by no later than 12:00 noon October 24, 2001.

Facsimile submissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB no later than 12:00 noon, October 24, 2001.

The Board requests, but does not require, 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring any suggestions for modification of the proposed regulatory action to the attention of staff in advance of the hearing.

# **STATUTORY AUTHORITY**

This regulatory action is proposed under the authority granted to the ARB in sections 39600, 39601, 39607, and 41954 of the Health and Safety Code. This action is proposed to implement, interpret, or make specific sections 39515, 39516, 39605, 40001, 41954, 41956.1, 41959, 41960 and 41960.2 of the Health and Safety Code; and sections 15375 and 15376 of the Government Code.

# **HEARING PROCEDURES**

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code. Following the public hearing, the ARB may adopt the regulatory language as originally proposed or with nonsubstantial or grammatical modifications. The ARB may also adopt the proposed regulatory language with other modifications if the modifications are sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action. In the event that such modifications are made, the full regulatory text, with the modifications clearly indicated, will be made available to the public for written comment at least 15 days before it is adopted. The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Environmental Services Center, 1001 "I" Street, First Floor, Sacramento, California 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

MICHAEL P. KENNY EXECUTIVE OFFICER

Date: August 28, 2001

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs see our Web-site at <a href="https://www.arb.ca.gov">www.arb.ca.gov</a>.

# California Environmental Protection Agency

# Air Resources Board

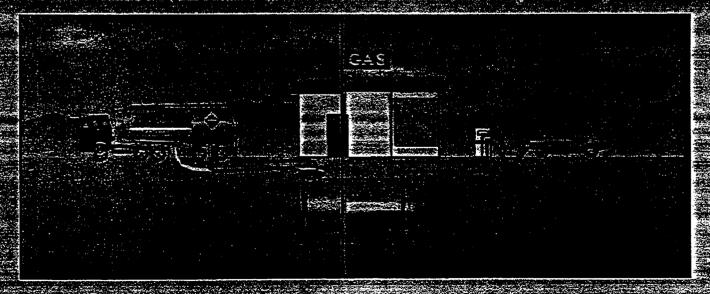
# HEARING NOTICE AND STAFF REPORT

INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING, PUBLIC HEARING TO CONSIDER THE ADOPTION AND AMENDMENT OF VAPOR RECOVERY SYSTEM CERTIFICATION AND TEST PROCEDURES

October 25: 2001.

President

Phase II (consumer)



# California Environmental Protection Agency

# Air Resources Board

#### STAFF REPORT:

INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING, PUBLIC HEARING TO CONSIDER THE ADOPTION AND AMENDMENT OF VAPOR RECOVERY SYSTEM CERTIFICATION AND TEST PROCEDURES

Date of Release: September 7, 2001 Scheduled for Consideration: October 25 or 26, 2001

#### Location:

Monterey Bay Unified Air Pollution Control District Board Hearing Room, Third Floor 24580 Silver Cloud Court Monterey, California

> Air Resources Board P.O. Box 2815 Sacramento, CA 95812

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Publication does not signify that the contents reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

## STAFF REPORT:

INITIAL STATEMENT OF REASONS FOR PROPOSED RULE MAKING, PUBLIC HEARING TO CONSIDER THE ADOPTION AND AMENDMENT OF VAPOR RECOVERY SYSTEM CERTIFICATION AND TEST PROCEDURES

Prepared by:

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# Reviewed by:

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## **ACKNOWLEDGEMENTS**

Staff wishes to acknowledge the participation and assistance of individuals from the following districts and organization in providing input on the draft vapor recovery test procedures:

Bay Area Air Quality Management District Glenn County Air Pollution Control District Monterey Bay Unified Air Pollution Control District San Diego County Air Pollution Control District South Coast Air Quality Management District Chevron U. S. A. Products Company

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## I. INTRODUCTION AND RECOMMENDATIONS

#### A. Introduction

State laws authorizes the California Air Resources Board (Board or CARB) to adopt procedures for certifying systems to control gasoline vapor emissions during gasoline marketing operations. In addition CARB is required to adopt test methods to determine compliance with CARB and district non-vehicular emissions standards. In 1975, the Board adopted the first vapor recovery certification and test procedures. The Board on March 23, 2000 approved the enhanced vapor recovery (EVR) regulations to correct problems found with in-use vapor recovery systems and to obtain additional emission reductions.

The EVR regulations require vapor recovery manufacturers to develop new equipment designs and systems to meet the new standards. During the certification process of these new designs and systems, staff found that some of the adopted test procedures are not applicable to new equipment designs and identified the need for new performance specifications and test procedures to evaluate these new systems. To make these performance specifications and test procedures apply to future certifications, staff proposes that the Board adopt them into the EVR regulations.

To improve the EVR regulations staff is proposing to modify four existing procedures, including the definitions, and to add three new test procedures. The following is a short summary of proposed modifications of existing certification or test procedures (designated as (amended)) and new procedures (designated as (new)):

1. D-200 Definition for Vapor Recovery Procedures (amended)

Proposed amendments include defining the term, static torque at Phase I adaptors, and clarifying the definitions for vapor guard (mini-boot), summer fuel, and winter fuel.

2. CP-201 Certification Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities (amended)

Proposed amendments include establishing a static torque performance specification of 108 pound-inch (9 pound-foot) for Phase I vapor and product adaptors as determined by proposed TP-201.1B Static Torque of Rotatable Phase I Adaptors. Staff is proposing cam and groove specifications for vapor and product adaptors. Other changes include specifying proposed TP-201.1C (Pressure Integrity of Drop Tube/Drain Valve Assembly) and TP-201.1D (Pressure Integrity of Drop Tube Overfill Protection Devices) to determine leak rates of the spill containment box and drop tube with overfill protection devices when the drop tube is below the spill containment box. Staff is proposing a

methodology for calculating the average daily pressure of the underground storage tank. The exponent in Equation 3-1 has been corrected to be consistent with other provisions in CP-201.

3. TP-201.1B Static Torque of Rotatable Phase I Adaptors (new)

A new certification and compliance test procedure is proposed to verify compliance with maximum 108-pound-inch static torque standard, and the 360 degree rotation requirement for product and vapor adaptors used at gasoline dispensing facilities.

4. TP-201.1C Pressure Integrity of Drop Tube/Drain Valve Assembly (new)

Staff proposes a new certification and compliance test procedure for measuring the leak rate of drain valves to determine compliance with the certification performance specification of 0.17 cubic feet per hour at a pressure of two inches water column. This procedure would apply in instances where the drop tube is located below the drain valve.

5. TP-201.1D Pressure Integrity of Drop Tube Overfill Protection Devices (amended)

Staff is proposing to amend an existing certification and compliance test procedure which would allow for measuring the leak rate of the drain valve in addition to the leak rate of the drop tube overfill protection device.

In addition staff proposes a new test procedure and a modification of an existing procedures at the request of the California Air Pollution Control Officer Association (CAPCOA). CAPCOA requested that the applicability of TP-201.4 (Dynamic Back Pressure) be expanded to include other types of vapor recovery system. Staff was requested by CAPCOA to develop a new shorter and abbreviated compliance procedure for determining liquid removal for balance systems. The following is a brief description of the proposed two test procedures.

1. TP-201.4 Dynamic Back Pressure (amended)

The proposed amendments modify an existing certification and compliance test procedure by adding four methodologies for configurations that are subject to the dynamic pressure standard but were not addressed in the current procedure.

2. TP-201.6C Compliance Determination of Liquid Removal Rate (new)

Staff proposes a new compliance test procedure that provides two options for determining the liquid removal rate for liquid removal devices used on balance vapor recovery systems.

## B. Recommendations

Staff recommends that the Board adopt the following:

- Amendments to the California Code of Regulations to incorporate the proposed certification and test procedures by reference (as outlined in Appendix 1)
- 2. Amendments to the incorporated vapor recovery system certification and test procedures (Appendix 2)

# II. BACKGROUND

# A. California's Vapor Recovery Program

In California, the implementation of the vapor recovery program is shared between CARB and the districts. CARB is responsible for certifying the vapor recovery systems that will be installed in gasoline dispensing facilities (service stations). This ensures that all vapor recovery systems are certified to one set of standards and requirements statewide. State law and district regulations require the installation of only those systems certified by CARB. Districts are responsible for inspecting and testing the vapor recovery systems once installed to ensure that the systems are operating as certified. Districts must use only those test procedures specified or approved by CARB for compliance determination.

Vapor recovery systems have been used in California to control reactive organic gases (ROG) emissions for over twenty years. The feasibility of the first vapor recovery systems was studied at the district level, particularly in San Diego and the Bay Area in the early 1970's. Enacted in 1975, state law requires CARB to "adopt procedures for determining the compliance of any system designed for the control of gasoline vapor emissions during gasoline marketing operations, with performance standards which are reasonable and necessary to achieve or maintain any applicable ambient air quality standard" (Health and Safety Code 41954 (a)).

In the late 1990s, CARB and district staffs conducted joint statewide inspections of in-use vapor recovery systems. These inspections revealed that many installed vapor recovery systems were operating less efficiently than as certified. As a result, the staff proposed and the Board approved the enhanced vapor recovery (EVR) regulations on March 23, 2000. The goal of EVR is to seek additional emissions reductions by increasing the stringency of the emission standards, improve the certification process to increase the performance and reliability of vapor recovery equipment, and re-evaluate currently certified systems. The new EVR regulations will apply to new gasoline dispensing facilities or major modification of existing facilities on or after the operative date of the regulations. Existing installations will have four years to comply as provided by state law. To avoid major disruption of the

gasoline marketing industry, specific EVR performance standards will be phased-in over the next several years.

# B. Air Quality Benefits for Controlling ROG Emissions from Gasoline Dispensing Facilities

One of the earliest and most successful control measures for ROG is vapor recovery for gasoline marketing operations. Even with current controls, petroleum product transfers are responsible for significant emissions. According to a 1995 emission inventory, petroleum marketing operations (which include emissions from service stations and cargo tank loading facilities) emit 77 tons per day of ROG statewide. This accounts for about 10% of the total ROG emissions of 740 tons per day from all stationary sources combined.

Created by the photochemical reaction of ROG and oxides of nitrogen (NO<sub>X</sub>), ground level ozone causes harmful respiratory effects including lung damage, chest pain, coughing, and shortness of breath. Ozone is particularly harmful to children, the elderly, athletes, and people with asthma. Adverse environmental effects of ozone include reduced crop yields and damage to exteriors of buildings.

Throughout the past 30 years, significant strides have been made in improving California's air quality. Unfortunately, many regions throughout California continue to exceed health-based state and federal air quality standards. Air quality standards are based upon key criteria pollutants including ozone, oxides of nitrogen, particulate matter, carbon monoxide, and sulfur dioxide. Areas of the state exceeding the state and federal ozone standards include the South Coast Air Basin, San Diego County, San Joaquin Valley, the Sacramento region, and Ventura County. As the new, more stringent, federal ozone standard is implemented, more areas of the state are likely to be categorized as non-attainment for ground level ozone.

# C. Description of Vapor Recovery Systems

#### Phase I Vapor Recovery System

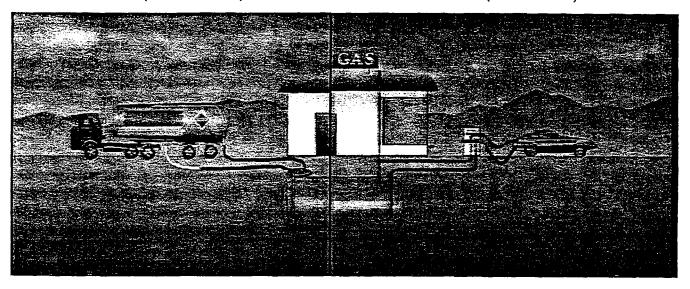
Each gasoline transfer will lead to displaced vapors. Vapor recovery systems are used throughout the gasoline marketing chain to contain vapors that would otherwise escape into the atmosphere. The first transfer occurs when a cargo tank is filled with product at a loading rack of a refinery terminal or a bulk plant. While the cargo tank is filled, gasoline vapor present in the cargo truck tank is displaced into a processing unit at the terminal or bulk plant. The recovered vapors are normally condensed back to liquid fuel. The second transfer involves the transfer of gasoline from the cargo truck tank to the stationary storage tanks of gasoline dispensing facilities (service stations). Recovery of vapor during the second transfer is called Phase I vapor recovery (Figure 1). As the storage tank of the gasoline dispensing facility is filled, vapors are displaced into the cargo

tank through hoses that connect the storage tank to the delivery cargo tank.

Figure 1
Phase I and Phase II Vapor Recovery Systems at Service Stations

Phase I (distribution)

Phase II (consumer)



# 2. Phase II Vapor Recovery System

Phase II vapor recovery systems control emissions resulting from gasoline transfer from the gasoline dispensing facility (service station) to vehicles (Figure 1). This is the type of vapor recovery equipment that many of us operate routinely when fueling our cars. The two main types of Phase II vapor recovery systems are balance and assist.

Balance systems can be identified by the long bellows or boot located around the spout of the nozzle, and the donut-like faceplate on the end of the bellows. A tight seal between the faceplate and the vehicle fillpipe is critical to ensure that the vapor displaced while filling the vehicle tank is routed back through the nozzle and hose to the underground tank vapor space.

Assist systems, by contrast, are often identified by the appearance of "bootless" nozzles. During vehicle refueling, vapors are collected by a dispenser actuated vacuum pump. In some cases, vapors are collected through a series of holes in the nozzle spout. Some assist systems also have processors to manage underground vapor space pressure. Two currently certified systems operate with thermal oxidizers on or near the vent pipe in order to reduce emissions.

## D. Legal Authorities

Section 41954 of the Health and Safety Code (Appendix 3 contains a copy of

section 41954) requires CARB to adopt procedures and performance standards for controlling gasoline emissions from gasoline marketing operations, including transfer and storage operations to achieve and maintain ambient air quality standards. This section also authorizes CARB, in cooperation with districts, to certify vapor recovery systems that meets the performance standards. Section 39607(d) of the Health and Safety Code requires CARB to adopt test procedures to determine compliance with CARB and districts non-vehicular standards. State law (section 41954) requires districts to use CARB test procedures for determining compliance with performance standards or specifications established by CARB.

To comply with state law, the Board adopted certification and test procedures found in title 17, Code of Regulations, sections 94110 to 94015 and 94101 to 94163. These regulations reference procedures for certifying vapor recovery systems and test procedures for verifying compliance with performance standards and specifications.

# E. Comparable Federal Regulations

There are no comparable federal regulations that certify gasoline vapor recovery systems for service stations; however, changes to CARB vapor recovery certification regulations may have a national impact. CARB certification is required by most other states that mandate the installation of vapor recovery systems in gasoline dispensing facilities.

## F. Distinction Between Certification and Compliance Test Procedures

CARB test procedures are used to accomplish two goals. First test procedures are used during the certification process to verify that performance standards or specifications are met. Second, districts use test procedures to determine compliance with performance standards or specifications established by the system certification. Certification test procedures are more rigorous and comprehensive because they are used to assess the system under various operating conditions. To promote statewide uniformity, districts are required to use test procedures specified by CARB for determining compliance with in-use vapor recovery systems. In some cases both certification and compliance test procedures are identical. In other instances the compliance test procedures are abbreviated and simplified versions of the certification test procedures.

# III. RULE DEVELOPMENT PROCESS AND PUBLIC OUTREACH EFFORTS

# A. Public Workshop

The proposed vapor recovery test methods were made available for public review via the Internet and hardcopy on June 8, 2001. Staff held a public workshop on June 20, 2001, in Sacramento. Workshop notices were sent to an extensive list of districts, equipment manufactures, associations of vapor recovery system users, oil companies, gasoline dispensing facility operators, vapor recovery equipment distributors, and vapor recovery testing organizations. Approximately 60 individuals attended the workshop. Several modifications have been made to the proposed test procedures based on written comments received during the public outreach process. The modified procedures were posted on the Internet on July 27, 2001, and further comments were invited. Additional changes were made based on comments received.

# B. Meetings with Districts and Other Agencies

Staff communicated frequently with district staff while preparing these proposals, in part through regular attendance at the CAPCOA Vapor Recovery Technical Committee meetings. A copy of the staff proposal was sent to the State Fire Marshal Office and Division of Occupational Safety and Health of the Department of Industrial Relations for comments.

#### C. Information Posted on the CARB Vapor Recovery Website

Once staff identified the need for new vapor recovery test procedures and revised certification performance specifications, CARB's vapor recovery web page was regularly updated to provide information and to solicit comments throughout the process of drafting the proposed procedures. For example, valuable feedback was obtained from various interested parties during the development of the proposed cam and groove specifications and static torque standard.

# IV. REASONS FOR AND SUMMARY OF PROPOSED AMENDMENTS OF CERTIFICATION AND TEST PROCEDURES

The EVR regulations establish performance standards and test procedures for certifying vapor recovery equipment. Performance standards and specifications used during the certification process verify that in-use vapor recovery systems will operate correctly. As manufacturers strive to meet the new EVR requirements, new equipment designs or systems are submitted for certification. Staff in reviewing these new designs or systems has found that existing performance specifications and test procedures were not adequate to evaluate some new designs or systems. As a result staff worked cooperatively with applicants to clarify performance specifications and to develop corresponding test procedures. Since the March 23, 2000, approval of the EVR

regulations by the Board, staff has developed additional performance specifications and test procedures for evaluating systems designed to comply with the Phase I EVR performance specifications. By continuing to update the vapor recovery certification and test procedures, CARB improves vapor recovery system certification.

# A. Proposed Phase I Vapor Recovery Certification and Test Procedures

1. CP-201 Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities.

CP-201 prescribes requirements for certification of vapor recovery systems for gasoline dispensing facility (service station). These requirements include performance standards and specifications, test procedure requirements and testing requirements. During the certification of EVR phase I systems, staff identified the need for new performance specifications for static torque and cam and groove dimensions for vapor and product adaptors used during delivery of gasoline to gasoline dispensing facilities.

Staff is proposing to amend CP-201 by specifying a static torque standard of 108 pound-inch (9 pound-foot) for rotatable vapor and product adaptors. This standard is necessary to ensure that adaptors are not tightened or loosen during fuel delivery to the gasoline dispensing facilities. The 108 pound-inch specification is based on the torque exerted on the adaptor with a delivery elbow and hose attached as the cargo tank driver "walks" the hose to drain fuel remaining in the hose after cargo tank shut-off is activated.

Staff found that no industry standards existed for cam and groove for the product adaptor. An industry standard was established for the vapor adaptor in the 1970s. Having an industry standards for both the vapor and product adators is critical to ensure that all adaptors and delivery elbows are compatible. In developing the cam and groove specifications, staff asked for suggestions and comments from adaptor and elbow manufacturers and other stakeholders. Based on comments received, staff developed proposed cam and groove specifications for the vapor and product adaptors, which again were submitted to the stakeholders for comments. There was general consensus among stakeholders of the need for uniform specifications and for the staff's proposed cam and groove specifications.

Other changes include specifying a procedure for measuring the leak rate of the drain valve of the spill containment box. With the placement of the drop tube below the spill containment box, the adopted test procedure is no longer applicable. The leak rate is to be determined by either TP-201.1C or TP-201.1D depending on the configuration. TP-201.1D would be used where there is a drop tube with an overfill protection device.

CP-201 specifies that the daily average positive pressure shall be used for

calculating the rolling 30-day average underground tank pressure. However, no methodology was indicated for determining the daily average positive pressure. The amendment provides a methodology and an example for determining the daily average positive pressure.

The current liquid retention test procedure (TP-201.2E Gasoline Liquid Retention in Nozzles and Hoses) specifies that each nozzle must be tested 10 times for certification testing. Staff is proposing to clarify CP-201 by specifying that four of the 10 refuelings must be fill-ups. Topoffs would be excluded.

Section 3.2.2 contains equations for calculating final allowable pressures for leak decay testing for Phase I systems. The exponent in Equation 3-1 has been corrected to reflect the more stringent standard required for assist Phase II vapor recovery systems (see section 4.2). This change will ensure that Phase I systems are compatible with both balance and assist Phase II vapor recovery systems.

# 2. D-200 Definition for Vapor Recovery Procedures

With the addition of a proposed static torque performance specification, staff is proposing to define this term in D-200. Other modifications include non-substantive clarification of the terms for vapor guard (mini-boot), summer fuel, and winter fuel.

# 3. TP-201.1B Static Torque of Rotatable Phase I Adaptors

Since proposed CP-201 establishes a static torque specification for vapor and product adaptors, TP-201.1B is a proposed certification and compliance test procedure to measure the static torque and 360 degree rotation of product and vapor adaptors used during cargo tank delivery. The 360 degree rotation is already a specification in the current CP-201. Determining the torque and rotation is necessary for proper operation of the adaptors.

A torque wrench and torque test tool are sufficient to perform this test outlined in proposed new test procedure, TP-201.1B. A tester installs the torque test tool on the adaptor and gently applies pressure to the torque wrench. Once the adaptor begins to rotate, a torque measurement is taken. A total of three measurements are taken and then averaged for a final result. The rotation of the adaptor through at least 360 degrees is then verified.

# 4. Method TP-201.1C Pressure Integrity of Drop Tube/Drain Valve Assembly

Over the past year, staff has evaluated new EVR systems used for the collection of vapor during Phase I deliveries. These new Phase I systems include placement of the drain valve so that liquid drains directly into the drop tube as opposed to earlier systems where the valve drained liquid into the storage tank

ullage (the vapor space above the fuel inside the tank). The new design is superior to older designs due to the fact that leaky drain valves will no longer allow vapor to vent from the storage tank to atmosphere. Since the drain valve is now isolated from the storage tank ullage, existing leak decay test procedures are no longer applicable for checking leak integrity of the drain valves.

Proposed TP-201.1C is a new certification and compliance test procedure that would allow the pressurization of the drop tube. This would determine if the drain valve complies with the leak rate performance specification of 0.17 cubic feet per hour at a pressure of two inches water column as set forth in the Certification Procedure CP-201.

Method TP-201.1D Pressure Integrity of Drop Tube Overfill Protection Devices

TP-201.1D (originally incorrectly designated as TP-201.2O) is used to determined the leak rate of drop tube overfill protection device. For the new EVR design where the liquid is drained into the drop tube, the current version of the test procedure cannot be used to measure separately the leak rate of the drop tube overfill protection device and drain valve. CP-201 specifies for each a leak rate of 0.17 cubic feet per hour at a pressure of two inches water column. The proposed TP-201.1D will allow separate measurement of the leak rate of the drain valve and drop tube overfill protection device by isolating the drain valve and the overfill protection device by inserting a bladder or seal into the top of the drop tube.

# B. Proposed Phase II Vapor Recovery Certification and Test Procedures

The California Air Pollution Control Officer Association (CAPCOA) requested that the Board update two test procedures that are used by districts for compliance determination. The first test procedure, TP-201.4 Dynamic Back Pressure, determines whether there are restrictions in vapor recovery piping systems. The current TP-201.4 is limited to balance systems and CAPCOA wanted its applicability expanded to vacuum assist systems. CAPCOA requested a shorter and simplified version of existing TP-201.6 (Determination of Liquid Removal of Phase II Vapor Recovery Systems of Dispensing Facilities) for compliance testing. TP-201.6 is used to determine if liquid removal devices on balance systems are capable of a removal rate of five (5) milliliters per gallon.

# 1. Method TP-201.4 Dynamic Back Pressure

TP-201.4 was last amended in 2000. This test procedures provides methodologies for determining the resistance of vapor flow (back pressure) through dispensing equipment by simulating flow through the vapor return path with the use of nitrogen. To be certified each system must meet the back pressure limits outlined in "CP-201 Certification Procedure for Vapor Recovery

Systems at Gasoline Dispensing Facilities." TP-201.4 is used as both as a compliance and certification test procedure to determine the back pressure caused by resistance to flow, and is used to verify that in-use vapor recovery systems' performance is similar to the certified system. The proposed amendments will expand the applicability to vacuum assist systems by adding four test methodologies. The methodologies differ to accommodate differences in vapor recovery system designs. Other changes are proposed to clarify the test procedure. The principle of the test measurement has not changed.

# 2. Method TP-201.6C Compliance Determination of Liquid Removal Rate

TP-201.6C, "Compliance Determination of Liquid Removal Rate," is a new compliance test procedure used to quantify the removal rate of liquid from the vapor passage of a balance system equipped with a liquid removal device. The proposed procedure was created in response to district concerns regarding the existing liquid removal test procedure (TP-201.6) which is used for both certification and compliance purposes. The primary objective of the proposed procedure is to provide a less time consuming and resource intensive liquid removal test method. Unlike the existing procedure, the proposed procedure allows testing to be conducted while other refueling activity occurs at the service station. The number of test runs required has been reduced, resulting in significant time savings. To ensure repeatability and consistency, the nozzle/hose orientation while dispensing fuel has been specified. In addition, the proposed compliance procedure reduces the amount of fuel dispensed, the handling of gasoline, and test related emissions.

The proposed test procedure provides two options to determine the compliance of liquid removal devices. Under option 1 (short version), liquid in the vapor path of a coaxial hose is drained and measured. If the volume of liquid drained exceeds 25 ml, a liquid removal test is conducted. For those hoses with less than 25 ml drained, no further testing is required. Under option 2 (long version), all hoses are evaluated regardless of the volume of liquid drained. Option 2 includes a pre-wetting and wall adhesion step. Both options test the liquid removal device by introducing gasoline into the vapor path of the coaxial hose through the nozzle bellows. After 7.5 gallons of gasoline is dispensed, the amount of gasoline remaining in the hose is measured and the liquid removal rate is determined. Each district shall specify which testing option is to be used by GDFs within the district.

## V. OUTSTANDING ISSUES

Staff received no comments on the following certification and test procedures:

1. TP-201.1B Pressure Integrity of Drop Tube/Drain Valve Assembly

- 2. TP-201.1C Static Torque of Rotatable Phase I Adaptors
- 3. TP-201.1D Pressure Integrity of Drop Tube Overfill Protection Devices
- 4. D-200 Definitions For Vapor Recovery Procedures

Staff received comments on CP-201, TP-201.4, and TP-201.6C and has addressed most of them. The following explains why staff did not accept certain comments, resulting in outstanding issues.

# A. Proposed CP-201

Staff received comments on CP-201 seeking to revise the current performance standards and specifications for certifying vapor recovery systems. Changes suggested by these comments were not incorporated or considered because they are beyond the scope of the staff's proposal.

# B. Proposed TP-201.4

One district questioned the validity of the results of conducting TP-201.4 on a station without first verifying tank tightness with a State Water Resources Control Board (SWRCB) test procedure and a CARB leak decay test, TP-201.3. The TP-201.4 test procedure is a stand alone test procedure to determine the dynamic backpressure performance of the vapor recovery piping back to the underground storage tanks. By not specifying an order for testing, TP-201.4 may be conducted by districts as a random and unannounced test of gasoline dispensing facilities. Each district may, in cooperation with local authority responsible for permitting underground storage tanks, determine the type, order and frequency of testing of gasoline dispensing facilities. Without the authority for certification of underground storage tanks, CARB does not have the statutory authority to require a SWRCB test of the tanks. TP-201.3 is leak tightness test and the results of such a test would have no bearing on the TP-201.4 results, because the proposed TP-201.4 testing requires the underground storage tanks to be vented to atmosphere whenever nitrogen flow is being introduced to the vapor recovery piping. Venting is necessary to eliminate test biases.

# C. Proposed TP-201.6C

During the public comment period one district requested that a constant specified by CARB be used to estimate wall adhesion for test option 2 under TP-201.6C. Under the current test procedure, TP-201.6, wall adhesion is determined by pouring 150 ml of gasoline into the hose, then immediately draining the hose, and calculating the difference. Based on wall adhesion data collected by staff, it was determined that a constant was not supported by the data. According to tests by CARB, wall adhesion values can vary anywhere between 8 ml and 20 ml. As a result, the proposal requires wall adhesion to be determined by testing.

## VI. ECONOMIC AND ENVIRONMENTAL IMPACTS

## A. Economic Impact

Overall, staff does not expect the proposed modifications to impose an unreasonable cost burden on gasoline dispensing equipment manufacturers, vapor recovery testers, or gasoline dispensing facilities. In one instance, a modification to a single procedure would shorten the time required to complete testing which would reduce test time and hourly labor charges. Two new procedures will slightly offset the savings. One minor component to consider is the cost for equipment required to complete testing. Each of these components involved in the economic impact to facilities and testers will be addressed in this section in a detailed manner. Staff believes that the test equipment costs would be minor in nature and the time savings required to complete vapor recovery testing will offset other costs.

# 1. Potential Impacts on Vapor Recovery Test Equipment

The proposed amendments could, in some cases, impose additional equipment costs on testers of vapor recovery systems. With the exception of the torque wrench and torque test tool, most testers already have test equipment that is applicable to the proposed test procedures. Additional equipment costs would occur only in the case of a tester without all of the necessary equipment to properly perform the testing procedures. Table VI-1 lists the one-time cost for a tester who does not have the required test equipment and would have to purchase each item.

The analysis shows that the proposed procedures may require a small, one-time expenditure for the testing contractor. This is not expected to increase the average testing costs. The increase in equipment cost will be small when spread over the approximately 11,500 gasoline dispensing facilities in the state. Indirect costs to GDFs would be incurred if the testing/maintenance contractors and organizations increase service costs. If the service costs were passed on the GDFs by the testing/maintenance contractors and organizations, the costs would be less than \$1.00 as a one time cost increase assuming that the increased equipment costs were not amortized over the life of the equipment (\$10,000 initial cost divided by 11,250 GDFs = \$0.88 per GDF). If districts conduct the proposed procedures and incur costs for purchasing the testing equipment, testing costs to GDFs as the result of any permit fee increase would be \$1.56 as a one time cost increase assuming that the districts do not amortize the fee increase over the life of the equipment (\$17,500 fee increase divided by 11,250 GDFs = \$1.56 per GDF).

Figure VI-1
Cost of Equipment/Tools Needed by
Proposed Test Procedures

Proposed Test Procedure	Test Equipment/Tools Required to Conduct Testing	Estimated Cost of Equipment/Tool
TD 004 4D	Torque Wrench	\$250
TP-201.1B	Torque Test Tool	<b>^</b> \$50
TD 004 40	Dust Cap	\$25
TP-201.1C	Pressure Fittings	\$75
TP-201.1D	No additional equipment	
TP-201.4	Pressure Fittings, Caps, etc.	\$125
TD 004 00	Plastic Funnels	\$15
TP-201.6C	Graduated Cylinders	\$25
	Potential Equipment Costs	\$565

# 2. Potential Impacts on Hourly Labor Requirements

Gasoline dispensing facilities are the main focus of the proposed amendments. These facilities are required to test vapor recovery equipment on an annual and sometimes more frequent basis as determined by district rules, policies, or guidelines. The proposal is expected to result in an overall net saving to the gasoline dispensing facilities due to reduction in the hourly labor costs of test personnel and districts as well as the ability for stations to remain open and generate revenue during testing.

As shown by Figure VI-2, there are some additional hourly requirements created by the proposed procedures as well as reductions resulting from the streamlining of existing procedures detailed in the next section. TP-201.1B and TP-201.C take less than one half hour each per facility. This time may vary slightly based on tester experience or difficulties encountered, but significant deviations in the time required to conduct the tests are not anticipated.

Figure VI-2
Time to Conduct Testing

Test Procedure	Current Procedure Hourly Requirements	Proposed Procedure Hourly Requirements	Difference
TP-201.1B	N/A	.50	+.50
TP-201.1C	N/A	.50	+.50
TP-201.1D	.50	1	+.50
TP-201.4	2	2	0
TP-201.6C	4	1	-3
-		Net Decrease	1.50 hours

The largest savings will come from the adoption of TP-201.6C. The time to complete proposed TP-201.6C testing will substantially be less than the existing TP-201.6. TP-201.6 is a certification test procedure and requires testing to be conducted with no other dispensing occurring. Districts using this procedure have typically interpreted this to mean that the facility must be closed down to conduct this test. In fact, it is possible to conduct the test when there is no dispensing of the affected product occurring; this can be done without closing down the facility. However, because the practice has been to require the facility to close down for this test, and because of the number of tests required by the certification procedure, this typically resulted in a loss of business to the facility as well as a considerable expenditure of inspector time. The largest hourly savings from the application of proposed TP-201.6C is due to reduction in the time to conduct the test.

For TP-201.4, staff believes that there are no differences in hourly requirements for compliance testing of existing GDF. This is based on the fact that the proposal for determining back pressure in Methodology 1 has not been modified from an earlier version of TP-201.4. The additional methodologies included in the proposal are identical to methodologies contained in TP-201.4 prior to May 2000. Under Methodology 6 testing time will be increased; however, as Methodology 6 will most likely only be used by districts at start up for the verification of correct vent riser piping configuration at a new GDF or a major modification to, or retrofit of, an existing GDF, the increase in testing time will be minimal.

#### B. Environmental Impacts of Proposed Amendments

 Emissions Associated with Conducting TP-201.1B, TP-201.1C, TP-201.1D, and TP-201.6C

No emissions are expected when conducting proposed TP-201.1B Static Torque of Rotatable Phase I Adaptors. This test determines the static torque value and 360-degree rotation of the adaptors. Conducting this test does not require

venting the underground storage tank or dispensing of any fuel. Emissions from conducting TP-201.1C and TP-201.1D are expected to be negligible. These proposed test procedures do not require the venting of the underground storage tank ullage. The ROG concentration in the ullage is at the saturation level. Conducting this test would result in a small unquantifiable amount of emissions into the air.

Currently, TP-201.6 requires dispensing of 10 gallons of fuel and specifies a prewetting and wall adhesion step. Proposed TP-201.6C provides two options for conducting the test. Option 1 requires testing those nozzles where 25 milliliters or more is drained from the hose. Running option 1 would require dispensing only 7.5 gallons of fuel, would eliminate the pre-wetting and wall adhesion steps. and would be conducted only when more 25 milliliters or more are found. Based on data submitted by one district, option 1 identified 234 defective liquid removal system out of 343 tests. The current liquid removal test, TP-201.6, would have identified 241 defective systems out of 343. Since option 1 would be nearly as effective as TP-201.6 and would result in faster identification of defective liquid removal system, staff believes that it is reasonable to assume that this would result in faster repairs of defective liquid removal systems. A defective liquid removal device results in loss of control efficiency. Option 2 requires the testing of all hoses regardless of the volume of liquid drained from the hose as found. In addition to dispensing 7.5 gallons of fuel, option 2 requires a pre-wetting and wall adhesion step similar to the current liquid removal test, TP-201.6. Option 2. however, causes fewer test related emissions (when compared to the current TP-201.6) because the amount of fuel dispensed is reduced from 10 to 7.5 gallons and the number of test runs required per nozzle is reduced from three to one. In addition, staff believes that emissions associated with conducting TP-201.6C are more than offset by a program in which defective liquid removal systems are repaired more quickly.

# Test Related Emissions Resulting From Proposed TP-201.4

With the aid of data from several districts, the percentage of Phase II Balance systems was estimated to be 40% statewide. This percentage was the basis we used to determine the amount of emissions associated with TP-201.4 for both Balance and Vacuum-Assist facilities. Other estimates used in our calculations, also obtained with the aid of local districts, are shown below.

- 11,500 gasoline dispensing facilities statewide (GDF)
- 40% balance GDF (4,600 facilities)
- 1,500 startup tests (40% balance, 60% Vacuum-Assist) annually
- 16.8 nozzles/GDF (balance facilities)

For Phase II Balance systems, TP-201.4 requires various methods of introducing nitrogen into a gasoline dispensing facility (GDF) at flow rates of 60 cubic feet per hour (CFH) and, in some instances 80 CFH. In each method, the Phase I

vapor poppet on the underground storage tank is required to be open to atmosphere which allows vapors to be released directly into the environment. Keeping the vapor poppet closed while testing will result in erroneous back pressure readings. Since districts required Methodology 1, 2, or 3 to be conducted annually, staff estimates based on the following calculations that about 1.8 tons of ROG are currently emitted annually.

#### EXAMPLE 1 - Impact of Methodology 1, 2 or 3

$$V = \left[\frac{[60 + 80](30)}{3600}\right] ((16.8)(4,600)) = 90,160 \text{ ft}^3 \text{ per year}$$

#### Where:

V = volume of emissions emitted during annual test, ft³ per year
60 = required nitrogen flow rates during the test, CFH per nozzle
80 = required nitrogen flow rates during the test, CFH per nozzle
30 = minimum time required for nitrogen feed, seconds
3,600 = conversion factor from seconds to hours, seconds per hour
16.8 = number of nozzles per GDF
4,600 = number of GDF tested per year

Using the average concentration of the volume emitted to atmosphere during testing, the mass emissions caused by conducting any of the various methods was calculated as follows:

#### EXAMPLE 2 - Mass Emissions Impact of Methodology 1, 2 or 3

$$M = \frac{(0.27)(56.13)(90,418)}{(386.9)(2000)} = 1.8 \text{ tons per year}$$

#### Where:

M	=	mass of non-methane organic compound (NMOC) emitted during the test, tons per year
0.27	=	average NMOC concentration
56.13	=	molecular weight of the span gas used during the test, lbs/lb-mole
90,160	=	volume emitted during the test, ft <sup>3</sup> per year
386.9	=	molar volume, ft <sup>3</sup> /lb-mole
2,000	=	conversion factor from pounds to tons

Example 2 was used to illustrate the mass emissions associated with Methodology 1, 2 or 3. This reflects the amount of test related emissions on a statewide basis using the estimated figures obtained from districts.

Methodology 4, 5, or 6 is used during start-up. Using the same methodology for determining mass emissions, emissions associated with Methodology 4, 5, or 6 are shown in Table VI-1. Compared to Methodology 1, 2, or 3, emissions associated with Methodology 4, 5, or 6 are small. Staff believes Methodology 4, 5, or 6 is used only one time per facility and not as part of a routine compliance inspection program. Therefore, only the estimated 1,500 annual start up tests were applied.

Table VI-1
Estimated Emissions from Running TP-201.4

TP-201.4 Test Methodology Number	Estimated NMOC Test Related Emissions Statewide (tons per year)		
Methodology 1, 2 or 3	1.8		
Methodology 4	0.10		
Methodology 5	N/A		
Methodology 6	0.04		

#### VII. ALTERNATIVES CONSIDERED

We have considered as an alternative the option of not adopting the proposed vapor recovery procedures. Not adopting the proposed procedures would be detrimental for the following reasons:

- A. Without revision, the existing vapor recovery certification and test methods may continue to be used without the improvements, clarifications, corrections, and additional quality assurance provisions contained in the proposed revisions.
- B. Without streamlined compliance test procedures, districts will continue to use more costly and time-consuming test procedures.
- C. Without the new test procedures, some EVR performance standards or specifications cannot be enforced as required under state law.
- D. Recent certification of equipment under the EVR regulations has demonstrated the need for additional performance specifications and definitions. New test procedures are required to enforce new and existing performance standards or specifications.

#### VIII. REFERENCES

1. 1999 California Almanac of Emissions and Air Quality

 Bay Area Air Quality Management Source Test Procedure ST-39, "Gasoline Dispensing Facilities - Air to Liquid Volumetric Ratio," draft dated July 1998

#### APPENDIX 1

#### PROPOSED AMENDMENTS TO CALIFORNIA CODE OF REGULATIONS

Note: Strikeout indicates deleted text; underline indicates inserted text.

Amend Sections 94010 and 94011, Article 1, Subchapter 8, Chapter 1, Division 3, Title 17, California Code of Regulations to read:

§ 94010. Definitions.

The definitions of common terms and acronyms used in the certification and test procedures specified in Sections 94011, 94012, 94013, 94014, and 94015 are listed in D-200, "Definitions for Vapor Recovery Procedures", adopted April 12, 1996, as last amended February 1, 2001 (insert amendment date), which are incorporated herein by reference.

NOTE: Authority cited: Sections 39600, 39601, 39607, and 41954, Health and Safety Code. Reference: Sections 39515, 41954, 41959, 41960 and 41960.2, Health and Safety Code.

§ 94011. Certification of Vapor Recovery Systems of Dispensing Facilities.

The certification of gasoline vapor recovery systems at dispensing facilities (service stations) shall be accomplished in accordance with the Air Resources Board's CP-201, "Certification Procedure for Vapor Recovery Systems of Dispensing Facilities" which is herein incorporated by reference. (Adopted: December 9, 1975, as last amended June 1, 2001 (insert amendment date)).

The following test procedures (TP) cited in CP-201 are also incorporated by reference.

TP-201.1 – "Volumetric Efficiency for Phase I Systems" (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.1A – "Emission Factor For Phase I Systems at Dispensing Facilities" (Adopted: April 12, 1996, as last amended February 1, 2001)

<u>TP-201.1B – "Static Torque of Rotatable Phase I Adaptors " (Adopted: (insert adoption date))</u>

<u>TP-201.1C - "Pressure Integrity of Drop Tube/Drain Valve Assembly " (Adopted: (insert adoption date))</u>

TP-201.1D – "Pressure Integrity of Drop Tube Overfill Protection Devices " (Adopted: February 1, 2001, as last amended (insert amendment date))

- TP-201.2 "Efficiency and Emission Factor for Phase II Systems" (Adopted: April 12, 1996, as last amended February 1, 2001)
- TP-201.2A "Determination of Vehicle Matrix for Phase II Systems" (Adopted: April 12, 1996, as amended February 1, 2001)
- TP-201.2B "Pressure Integrity of Vapor Recovery Equipment" (Adopted: April 12, 1996, as last amended February 1, 2001)
- TP-201.2C "Spillage from Phase II Systems" (Adopted: April 12, 1996, as last amended February 1, 2001)
- TP-201.2D "Post-Fueling Drips from Nozzle Spouts" (Adopted: February 1, 2001)
- TP-201.2E "Gasoline Liquid Retention in Nozzles and Hoses" (Adopted: February 1, 2001)
- TP-201.2F "Pressure-Related Fugitive Emissions" (Adopted: February 1, 2001)
- TP-201.2H "Determination of Hazardous Air Pollutants from Vapor Recovery Processors" (Adopted: February 1, 2001)
- TP-201.20 "Pressure Integrity of Drop Tube Overfill Protection Devices" (Adopted: February 1, 2001)
- TP-201.3 "Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities" (Adopted: April 12, 1996, as last amended March 17, 1999)
- TP-201.3A "Determination of 5 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities" (Adopted: April 12, 1996)
- TP-201.3B "Determination of Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities with Above-Ground Storage Tanks" (Adopted: April 12, 1996)
- TP-201.3C "Determination of Vapor Piping Connections to Underground Gasoline Storage Tanks (Tie-Tank Test)" (Adopted: March 17, 1999)
- TP-201.4 "Determination of Dynamic <u>Back Pressure Performance of Vapor Recovery Systems of Dispensing Facilities</u>" (Adopted: April 12, 1996, as last amended April 28, 2000 (insert amended date))

TP-201.5 – "Air to Liquid Volume Ratio" (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.6 – "Determination of Liquid Removal of Phase II Vapor Recovery Systems of Dispensing Facilities" (Adopted: April 12, 1996, as last amended April 28, 2000)

<u>TP-201.6C – "Compliance Determination of Liquid Removal Rate" (Adopted: [insert date of adoption]</u>

NOTE: Authority cited: Sections 39600, 39601, 39607, and 41954, Health and Safety Code. Reference: Sections 39515, 41954, 41956.1, 41959, 41960 and 41960.2, Health and Safety Code.

Amend Sections 94153, 94155, and 94163 Article 2, Subchapter 8, Chapter 1, Division 3, Title 17, California Code of Regulations to read:

§ 94153. Test Method for Determining the Dynamic Pressure Performance of Phase II Vapor Recovery Systems of Dispensing Facilities.

The test method for determining the dynamic pressure performance of Phase II vapor recovery systems of dispensing facilities with above-ground storage tanks is set forth in the Air Resources Board's TP-201.4 "Determination of Dynamic Back Pressure Performance of Vapor Recovery Systems of Dispensing Facilities" which is incorporated herein by reference. (Adopted: April 12, 1996, as last amended April 28, 2000 [insert amendment date])

NOTE: Authority cited: Sections 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 39515, 39516, 39605, 40001 and 41954, Health and Safety Code.

§ 94155 Compliance Test Method for Determining Liquid Blockage of Phase II Vapor Recovery Balance Systems at Dispensing Facilities

The <u>compliance</u> test method for determining the liquid blockage of <u>a Phase II vapor</u> recovery system is set forth in the Air Resources Board's TP-201.6<u>C</u>, "<u>Compliance</u> Determination of Liquid Removal <u>Rate of Phase II Vapor Recovery Systems of Dispensing Facilities</u>" which is incorporated herein by reference. (Adopted: April 12, 1996 [insert adoption date], as last amended April 28, 2000)

NOTE: Authority cited: Sections 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 39515, 39516, 39605, 40001 and 41954, Health and Safety Code.

§ 94163. Test Method for Pressure Integrity of Drop Tube Overfill Protection Devices.

The test method for determining the pressure integrity of drop tube overfill protection devices is set forth in the Air Resources Board's TP-201.201D "Pressure Integrity of Drop Tube Overfill Protection Devices" which is incorporated herein by reference. (Adopted: February 1, 2001, as last amended [insert adoption date])

NOTE: Authority cited: Sections 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 39515, 39516, 39605, 40001 and 41954, Health and Safety Code.

Adopt Sections 94164 and 94165, Article 2, Subchapter 8, Chapter 1, Division 3, Title 17, California Code of Regulations to read:

§ 94164. Test Method for Static Torque and Rotation of Rotatable Phase I Adaptors

The test method for determining the static torque and rotation of Phase I vapor and product adaptors is set forth in the Air Resources Board's TP-201.1B, "Static Torque of Rotatable Phase I Adaptors" which is incorporated herein by reference. (Adopted: [insert adoption date])

NOTE: Authority cited: Sections 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 39515, 39516, 39605, 40001 and 41954, Health and Safety Code.

§ 94165. Test Method for Pressure Integrity of Drop Tube/Drain Valve Assembly

The test method for determining the pressure integrity of drop tube/drain valve assembly is set forth in the Air Resources Board's TP-201.1C, "Pressure Integrity of Drop Tube/Drain Valve Assembly" which is incorporated herein by reference. (Adopted: [insert adoption date])

NOTE: Authority cited: Sections 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 39515, 39516, 39605, 40001 and 41954, Health and Safety Code.

### Appendix 2

Proposed Amendments of Vapor Recovery System Certification and Test Procedures

## California Environmental Protection Agency

# Air Resources Board

#### **Vapor Recovery Definitions**

#### **PROPOSED D-200**

# DEFINITIONS FOR VAPOR RECOVERY PROCEDURES

Adopted: April 12, 1996 Amended: March 17, 1999 Amended: February 1, 2001

Amended:

Note: The text is shown in strikeout to indicate text that is proposed for deletion and <u>underline</u> to indicate text that is proposed for addition. Throughout the text, where quotation marks are proposed for deletion, the deleted marks are shown as ".

## California Environmental Protection Agency Air Resources Board

#### Vapor Recovery Definitions

D-200

# Definitions for Vapor Recovery Procedures

#### 1 APPLICABILITY

The terms and acronyms contained herein are applicable for the *Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities*, *Gasoline Bulk Plants, Gasoline Terminals, Cargo Tanks, and Novel Facilities*. They are intended as a clarification of the terms and acronyms used throughout the Certification and Test Procedures.

#### 2 TERMS

#### "airport refueller"

is defined as a cargo tank which: has a total capacity no greater than 5000 gallons; exclusively transports avgas and jet fuel; and is not licensed for public highway use.

#### "assist"

refers to a vapor recovery system, which employs a pump, blower, or other vacuum inducing devices, to collect and/or process vapors at a subject facility.

#### "balance"

refers to a vapor recovery system which uses direct displacement to collect and/or process vapors at a subject facility.

#### "blend valve"

refers to the valve in a dispenser that typically creates specific product grade by blending two other product grades in a ratio.

#### "bootless nozzle"

refers to identifiesy a type of vapor recovery nozzle that does not have a bellows, or "boot," over the length of the nozzle spout.

#### "bulk plant"

refers to an intermediate gasoline distribution facility where delivery to and from storage tanks is by cargo tank.

#### "cargo tank"

means any container, including associated pipes and fittings, that is used for the transportation of gasoline on any highway and is required to be certified in accordance with Section 41962 of the California Health and Safety Code.

#### "certification procedures"

document certified performance standards and performance specifications for vapor recovery systems, and document test procedures for determining compliance with such standards and specifications.

The purpose of such procedures is to provide certified performance standards and performance specifications for performance levels equal to or greater than those levels required by federal, state, and local statutes, rules, and regulations applicable at the time that any ARB Executive Order certifying a system is signed.

#### "certification tests"

are-tests which, as required by a certification procedure or an ARB Executive Order:

are performed before certification to determine compliance with a certified performance standard and

are performed after certification to determine compliance with a certified performance standard.

**Note:** Some ARB Executive Orders require periodic certification testing after certification. Also, compare with "compliance tests" below.

#### "compartment"

means a liquid-tight division of a cargo tank.

#### "compliance tests"

are-tests which, as required by a certification procedure or an ARB Executive Order:

are performed before certification to evaluate and determine a certified performance specification and

are performed after certification to determine compliance with a certified performance specification.

#### "district"

refers to any of California's local air pollution agencies, including the air

pollution control districts and air quality management districts.

#### "effective date"

refers to the date on which a provision has the effect of state law.

#### "emission factor"

refers to a performance standard expressed as pounds of hydrocarbon per 1,000 gallons of gasoline dispensed.

#### "Executive Order"

refers to a document issued by the Executive Officer that certifies a vapor recovery system.

#### "existing installation"

means-any gasoline dispensing facility that is not a new installation.

#### "fugitive emissions"

refers to those emissions of hydrocarbon vapors emitted from a GDF due to evaporative loss from spillage or may also include those pressure-related fugitive emissions as defined below.

#### "gastight"

means exhibiting no vapor leak(s).

#### "gasoline"

means-any petroleum distillate having a Reid vapor pressure of four pounds or greater and meeting the requirements of title 13, California Code of Regulations, section 2250 et seq.

#### "gasoline dispensing facility"

refers to a facility which dispenses gasoline to the end user.

#### "hold-open latch"

refers to a certified device which is an integral part of the dispensing nozzle and is manufactured specifically for the purpose of dispensing gasoline without requiring the consumer's physical contact with the nozzle during fueling operations.

#### "incinerator"

means-any assist processor designed to control hydrocarbon emissions by any kind of oxidation which generates exhaust which is so hot and variable in volume that such volume can only be determined by correlated measurements and thermodynamic principles, rather than direct measurement.

#### "insertion Interlock"

refers to-any certified mechanism which is an integral part of a bellows-

equipped dispensing nozzle which prohibits the dispensing of fuel unless the bellows has been compressed.

#### "leak detection solution"

refers to any solution containing soap, detergent or similar materials which promote formation of bubbles, and which is used to wet joints or surfaces from which gas may be leaking, and which causes bubbles to form at the site of any escaping gas.

#### "leak free"

refers to a liquid leak of no greater than three drops per minute.

#### "liquid condensate trap (knock-out pot, thief port)"

refers to a device designed to collect liquid that condenses in the vapor return line in a manner that allows it to be evacuated and ensures that the vapor return line will not be blocked by the accumulation of liquid.

#### "liquid leak"

A liquid leak is defined to be the dripping of liquid organic compounds at a rate in excess of three (3) drops per minute from any single leak source other than the liquid fill line and vapor line disconnect operations. For cargo tanks, a liquid leak from liquid product line and vapor line disconnect operations is defined to be:

(a) more than two (2) milliliters liquid drainage per disconnect from a top loading operation; or

(b) more than ten (10) milliliters liquid drainage from a bottom loading operation. Such liquid drainage for disconnect operations shall be determined by computing the average drainage from three consecutive disconnects at any one permit unit.

#### "liquid removal device"

Refers to a device designed specifically to remove liquid from the vapor return portion of a vapor hose.

#### "liquid retain"

refers to any liquid gasoline retained in the vapor passage of the nozzle/hose assembly, on the atmospheric side of the vapor check valve.

#### "lower explosive limit (LEL)"

refers to the minimum volumetric fraction of combustible gas, in air, which will support the propagation of flame; commonly expressed in units of percent (%) or parts per million (ppm).

Standard references for physical properties of combustible gases differ by a

few percent in their listed values for lower explosive limit (LEL) and differ also in terms employed. For clarity:

- (1) "LEL" shall mean the same as "lower limit of flammability," "lower end of the explosive range", and other related terms in common technical discourse.
- (2) The authoritative reference for determination of LEL values shall be the chapter "GASEOUS FUELS", by C. C. Ward, pages 7-21 to 7-24 of Marks' Standard Handbook for Mechanical Engineers, Eighth Edition, McGraw Hill, New York, 1978.
- (3)—The LEL for propane is 2.1% (21,000 ppm).

#### "major modification"

means the addition, replacement, or removal of an underground storage tank, underground piping, vapor piping within a dispenser, or a dispenser at an existing installation. The replacement of a dispenser is not a major modification when the replacement is occasioned by end user damage to a dispenser.

#### "mini-boot (vapor guard)"

refers to a device that is permanently installed at the base of a bootless vapor recovery nozzle spout to enhance the effectiveness of vapor collection.

#### "multi-product dispenser"

refers to a dispenser of multiple products with two or more hoses per dispenser side.

#### "National Institute of Standards and Technology"

refers to the United States Department of Commerce, National Institute of Standards and Technology (NIST) which, through its Standard Reference Materials (SRM) Program, provides science, industry, and government with a source of well-characterized materials certified for chemical composition or for some chemical or physical property. These materials are designated SRMs and are used to calibrate instruments and to evaluate analytical methods and systems, or to produce scientific data that can be referred readily to a common base.

#### "new installation"

means a gasoline dispensing facility that is not constructed as of the operative date of the latest amendments to Certification Procedure CP-201 or a gasoline dispensing facility constructed as of the operative date of the latest amendments to Certification Procedure CP-201 that has undergone a major modification on or after the operative date of the amendments.

#### "novel"

is a modifier which indicates a vapor recovery system (or system feature) or facility to which the written procedures (of general applicability) do not apply; for such a novel system or facility, new system-specific or facility-specific performance specifications and test procedures shall be developed and required as conditions of certification.

#### "nozzle bellows (nozzle boot)"

refers to the flexible device around the spout of some vapor recovery nozzles, utilized to contain the vapor displaced from the vehicle.

#### "on-board refueling vapor recovery system"

refers to vehicle based system required by Title 13, California Code of Regulations, Section 1978, or Part 86, Code of Federal Regulations.

#### "operative date"

refers to the date on which a regulated person is first required to act or is prohibited from acting.

#### "over-fill protection device"

refers to a device designed to stop the delivery of product to a storage tank to prevent the over-filling of the tank and potential spillage.

#### "phase I"

refers to control of vapors during the transfer of gasoline from the cargo tank to the gasoline dispensing facility.

#### "phase II"

refers to the control of vapors during the transfer of gasoline from the gasoline dispensing facility to the vehicle.

#### "portable fuel container"

means-any container or vessel that is designed or used primarily for receiving, transporting, storing, and dispensing fuel.

#### "pressure-related fugitive emissions"

refers to those emissions of hydrocarbon vapors emitted from a GDF due to a positive gauge pressure in the headspace (ullage) of the gasoline storage tank. These emissions do not include transfer emissions at the nozzle/fillpipe interface nor the emissions from the vent pipe P/V valve, provided that the cracking pressure of the P/V valve has been exceeded.

#### "processor"

refers to a vapor processor, either destructive or non-destructive, utilized on a vacuum assist system.

#### "Reid Vapor Pressure"

refers to the absolute vapor pressure of volatile petroleum liquids, except liquefied petroleum gases, as determined in accordance with ASTM D323-89.

#### "spillage"

refers to liquid which enters the environment from a dispensing facility, except for liquid which leaves such dispensing facility in a vehicle tank or cargo tank.

The following definitions apply for the determination of spillage as defined above:

- (1) "pre-dispensing spillage" refers to spillage which occurs between:
  - (a) the time when a dispensing nozzle is removed from a dispenser and
  - (b)—the time when the dispensing nozzle is inserted into the tank receiving the dispensed liquid
- (2) "dispensing spillage"

refers to spillage which occurs between:

- (a)—the time when the dispensing nozzle is inserted into the tank receiving the dispensed liquid and
- (b)—the time when the dispensing nozzle is withdrawn from the tank receiving the dispensed liquid
- (3) "post-dispensing spillage" refers to spillage which occurs between:
  - (a) the time when the dispensing nozzle is withdrawn from the tank receiving the dispensed liquid and
  - (b) the time when the dispensing nozzle is returned to a dispenser.

#### "spitback"

refers to the forcible ejection of liquid gasoline upon activation of the nozzle's primary shutoff mechanism.

#### static torque of phase I adaptor

the amount of torque, measured as pound-inches, required to start the rotation of a rotatable phase I adaptor as measured in accordance with TP-201.1B.

#### -"submerged fillpipe"

- (1) means any fillpipe which has its discharge opening entirely submerged when the liquid level is six inches above the bottom of the tank.
- (2) when referring to a tank which is loaded from the side, means any fillpipe which has its discharge opening entirely submerged when the liquid level is 18 inches above the bottom of the tank.

#### "summer fuel"

means fuel that complies is required to comply with the requirements of title 13, California Code of Regulations, section 2262.4.

#### "test procedures"

specify equipment and techniques for determining the performance and compliance status of vapor recovery systems relative to certified performance standards and associated certified performance specifications.

#### "terminal"

refers to a primary distribution facility for the loading of cargo tanks that deliver gasoline to bulk plants, service stations and other distribution points; and where delivery to the facility storage tanks is by means other than by cargo tank.

#### "top off"

refers to the attempt to dispense gasoline to a motor vehicle or utility equipment fuel tank after the dispensing nozzle primary shutoff mechanism has engaged. The filling of a class of vehicle tanks which, because of the configuration of the fill pipe, cause premature activation of the primary shutoff, shall not be considered topping off.

#### "transition flow"

refers to the flow rate at which a transition occurs in the slope of the plot of flow rate versus pressure for a valve tested per TP-201.2B.

#### "ullage"

refers to the empty volume of any container. For example, the ullage of a tank designed primarily for containing liquid is the volume of the tank minus the volume of the liquid.

#### "underground storage tank"

refers to any one or combination of tanks, including pipes connected thereto, which is used for the storage of gasoline and which is substantially or totally beneath the surface of the ground.

#### "unihose dispenser"

refers to a multi-product dispenser that has only hose and nozzle per

dispenser side.

#### vapor guard (mini-boot)

a device that is permanently installed at the base of a bootless vapor recovery nozzle spout to enhance the effectiveness of vapor collection.

#### "vapor leak"

refers to a vapor leak measured as less 10,000 parts per million on a methane calibrated gas detector, measured at a minimum distance of one centimeter from the source in accordance with EPA Reference Method 21, compliance with the static pressure integrity requirements as determined by TP-201.3, or the absence of bubbles using a liquid leak detector solution.

#### "vapor recovery system"

means a vapor gathering system capable of collecting the hydrocarbon vapors and gases discharged and a vapor disposal system capable of processing such hydrocarbon vapors and gases so as to prevent their emission into the atmosphere, with all tank gauging and sampling devices gastight except when gauging or sampling is taking place.

#### "vapor recovery system for gasoline dispensing facility (GDF)"

refers to all equipment used at a GDF to recover, contain, and transfer gasoline vapors generated by refueling vehicle tanks, gasoline storage tanks, and portable fuel containers, including, but not limited to, dispensing equipment, couplers, fittings, processors, control boards, gauges, and monitors.

#### "vent"

means any plumbing which conveys an air/vapor mixture from a vapor recovery system to the atmosphere.

#### "winter fuel"

means-fuel that is not <u>required to comply with the regulations that are applicable to summer fuel.</u>

#### 3 ACRONYMS

#### "ACF"

actual cubic feet (see "CF", "CFH", and "CFM") at sampling conditions.

#### "APCD"

refers to one of California's Air Pollution Control Districts.

#### "AQMD"

refers to one of California's Air Quality Management Districts.

#### "A/L Ratio" or "A/L"

refers to air to liquid ratio.

#### "ARB"

refers to the California Air Resources Board.

#### "ARB Executive Officer" or "Executive Officer"

refers to the Executive Officer of the ARB or his or her authorized representative or designate.

#### **AST**

aboveground storage tank

#### "CARB"

California Air Resources Board.

#### **"CCR"**

California Code of Regulations.

#### "CF"

cubic feet.

#### "CFR"

Code of Federal Regulations.

#### "CT#"

cargo tank number issued by the Executive Officer.

#### "CFH"

cubic feet per hour.

#### "CFM"

cubic feet per minute.

#### "DMS"

California Department of Food and Agriculture, Division of Measurement Standards.

#### "DOSH"

California Department of Industrial Relations, Division of Occupational Safety and Health.

#### "Eng. Eval."

engineering evaluation.

#### <u>"EO"</u>

Executive Order.

#### "FID"

flame ionization detector.

#### "GC/FID"

gas chromatograph with flame ionization detector.

#### "GDF"

gasoline dispensing facility.

#### "H&SC"

California Health and Safety Code.

#### "ID"

inside diameter.

#### "ID#"

identification number.

#### "ISD"

In-Station Diagnostics.

#### "LDS"

leak detection solution.

#### "LEL"

lower explosive limit.

#### "LPM"

liters per minute.

#### "mmHg"

millimeters of mercury (unit of pressure).

#### "MPD"

multi-product dispenser.

#### "N2"

nitrogen gas.

#### "NDIR"

non-dispersive infrared.

#### "NIST"

National Institute of Standards and Technology.

# "ORVR" onboard refueling vapor recovery. "PV or P/V Valve" pressure/vacuum relief vent valve. "SFM" California State Fire Marshal. "Sec." section. "Spec." specification. "Std." standard. "UST" underground storage tank.

inches of water column (unit of pressure).

inches of water column, gauge (unit of pressure).

"WCa"

## California Environmental Protection Agency

# Air Resources Board

Vapor Recovery Certification Procedure

PROPOSED CP - 201

Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities

Adopted: December 9, 1975
Amended: March 30, 1976
Amended: August 9, 1978
Amended: December 4, 1981
Amended: September 1, 1982
Amended: April 12, 1996
Amended: April 28, 2000
Amended: February 1, 2001
Amended: June 1, 2001
Amended July 25, 2001

Amended:

Note: The text is shown in strikeout to indicate text that is proposed for deletion and <u>underline</u> to indicate text that is proposed for addition. (Page numbers in the table of contents will be corrected in finalized CP-201.)

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## California Environmental Protection Agency Air Resources Board

#### Vapor Recovery Certification Procedure

CP-201

Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities

A set of definitions common to all Certification and Test Procedures are in:

#### **D-200 Definitions for Vapor Recovery Procedures**

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

#### 1. GENERAL INFORMATION AND APPLICABILITY

This document describes the procedure for evaluating and certifying Phase I and Phase II vapor recovery systems, and components, used at Gasoline Dispensing Facilities (GDF). A CARB Executive Order certifying the system shall be issued only after all of the applicable certification requirements have been successfully completed.

This Certification Procedure, CP-201, is adopted pursuant to Section 41954 of the California Health and Safety Code (CH&SC) and is applicable to vapor recovery systems installed at gasoline dispensing facilities for controlling gasoline vapors emitted during the fueling of storage tanks (Phase I) and the refueling vehicle fuel tanks (Phase II). Vapor recovery systems are complete systems and shall include all associated dispensers, piping, nozzles, couplers, processing units, underground tanks and any other equipment or components necessary for the control of gasoline vapors during Phase I or Phase II refueling operations at GDF.

#### 1.1 Legislative and Regulatory Requirements of Other State Agencies

As required pursuant to Sections 41955 and 41957 of the CH&SC, the Executive Officer shall coordinate this certification procedure with:

- 1.1.1 Department of Food and Agriculture,Division of Measurement Standards (DMS)
- 1.1.2 Office of the State Fire Marshall (SFM)
- 1.1.3 Department of Industrial Relations, Division of Occupational Safety and Health (DOSH)

Prior to certification of the vapor recovery system by the Executive Officer, the applicant shall submit plans and specifications for the system to each of these agencies. Certification testing by these agencies may be conducted concurrently with CARB certification testing; however, the approval of the SFM, DMS and DOSH shall be a precondition to certification by CARB. The applicant is responsible for providing documentation of these approvals to CARB.

#### 1.2 Requirement to Comply with All Other Applicable Codes and Regulations

Certification of a system by the Executive Officer does not exempt the system from compliance with other applicable codes and regulations such as state fire codes, weights and measures regulations, and safety codes and regulations.

#### 2. GENERAL PERFORMANCE STANDARDS AND SPECIFICATIONS

#### 2.1 Performance Standards

A performance standard defines the minimum performance requirements for certification of any system, including associated components. Ongoing compliance with all applicable performance standards shall be demonstrated throughout certification testing. Systems and components shall comply, throughout the warranty period, with the applicable performance standards.

#### 2.2 Performance Specifications

A performance specification is an engineering requirement that relates to the proper operation of a specific system or component thereof. Performance specifications shall be identified in the application for certification. Ongoing compliance with the minimum level of performance specifications identified herein shall be demonstrated throughout certification testing and specified in the certification Executive Orders. Any applicant may request certification to a performance specification that is more stringent than the minimum performance standard or specification. The performance specification to which a system or component is certified shall be the minimum allowable level of performance the component is required to meet throughout the warranty period. Typical performance specifications include, but are not limited to, pressure drop and pressure integrity.

#### 2.3 Innovative System

The innovative system concept provides flexibility in the design of vapor recovery systems. A vapor recovery system that fails to comply with an identified performance standard or specification may qualify for consideration as an innovative system, provided that the system meets the primary emission factor, and complies with all other applicable requirements of certification.

#### 2.4 Additional or Amended Performance Standards or Performance Specifications

Whenever these Certification Procedures are amended to include additional (or modify existing) performance standards or performance specifications, any system that is certified as of the effective date of more stringent standards or specifications shall remain certified until the operative date.

- 2.4.1 The effective date of adoption for all performance standards and specifications contained herein, except as otherwise specified in Table 2-1, shall be April 1, 2001.
- 2.4.2 The operative date shall be the effective date of adoption of the more stringent performance standards of specifications, except as otherwise specified below. Certifications shall expire on the operative date of amended or additional performance standards or specifications unless the Executive Officer determines that the system meets the amended or additional performance standards or specifications. Upon the operative date of amended or additional performance standards or specifications, only systems complying with the more stringent performance standards or specifications may be installed. Systems installed prior to this date shall be permitted to remain in use provided they comply with the conditions in Section 19 of this procedure.
- 2.4.3 In determining whether a previously certified system conforms with any additional performance standards, specifications or other requirements adopted subsequent to certification of the system, the Executive Officer may consider any appropriate information, including data obtained in the previous certification testing of the system in lieu of new testing.

Table 2-1
Effective and Operative Dates for
Performance Standards and Specifications

Performance Type	Requirement	Sec.	Effective Date	Operative Date
All Phase I Standards and Specifications	As specified in Table 3-1 —	3	April 1, 2001	July 1, 2001
ORVR Compatibility <sup>1</sup>	Interaction of Refueling ORVR Vehicles Shall Not Cause the System to Exceed the applicable Efficiency or Emission Standard, Including ORVR Penetrations to 80%	4.1	April 1, 2001	April 1, 2003
Nozzle Criteria	Post-Refueling Drips ≤ 1 drop/refueling	4.7	April 1, 2003	April 1, 2004
Liquid Retention	≤ 350 ml/1,000 gals.	4.8	April 1, 2001	July 1, 2001
Liquid Retention Nozzle Spitting	≤ 100 ml/1,000 gals. ≤ 1.0 ml /nozzle/fueling	4.8	April 1, 2001	April 1, 2004
Spillage (including drips from spout)	≤ 0.24 pounds/1,000 gallons	4.3	April 1, 2001	April 1, 2004
For GDF > 1.8 mil. gal/yr.	ISD Requirements	Арр.	April 1, 2003	Same
For GDF > 160,000. gal/yr. <sup>2</sup>	ISD Requirements	10, App.	April 1, 2004	Same
All other Phase II Standards and Specifications	As specified in Tables 4-1 through 8-2.	4,5,6, 7,8	April 1, 2003	Same

<sup>&</sup>lt;sup>1</sup> Effective January 1, 2001, state law requires the certification of only those systems that are ORVR compatible (Health and Safety Code section 41954, as amended by Chapter 729, Statutes of 2000; Senate Bill 1300).

 $<sup>^2</sup>$  GDF  $\leq$  160,000 gal/yr are exempted from ISD requirements.

#### 3. PHASE I PERFORMANCE STANDARDS AND SPECIFICATIONS

Table 3-1 summarizes the Phase I Performance Standards and Specifications applicable to all Phase I and Phase II vapor recovery systems.

Table 3-1

Phase I Performance Standards and Specifications

APPLICABLE TO ALL VAPOR RECOVERY SYSTEMS

Performance Type	Requirement	Sec.	Std. Spec.	Test Procedure
Phase I Efficiency	≥ 98.0%	3.1	Std.	TP-201.1 TP-201.1A
Phase I Emission Factor	HC ≤ 0.15 pounds/1,000 gallons	3.1	Std.	TP-201.1A
Static Pressure Performance	In accordance with section 3.2	3.2	Std.	TP-201.3
Pressure Integrity of Drop-Tube with Overfill Protection	≤ 0.17 CFH at 2.0 inches H <sub>2</sub> O	3.3	Spec.	TP- 201. <del>20</del> 1D
Phase I Product <u>and</u> <u>Vapor Adaptor/Delivery</u> <u>Elbow Connections</u>	Rotatable 360°, ⊖or equivalent	3.4	Spec.	TP-201.1B Testing-and Eng. Eval.
Phase I Vapor Adaptor/ Delivery Elbow Connection	Rotatable 360°, or equivalent		<del>Spec.</del>	Testing and Eng. Eval.
Phase I Product Adaptor Cam and Groove	As shown in Figure 3A		Spec.	Micrometer
Phase I Vapor Recovery Adaptor Cam and Groove	CID A-A-59326 (As shown in Figure 3B)	<u>3.4</u>	Spec.	Micrometer
Phase I Vapor Adaptor	Poppetted		Spec.	Testing and Eng. Eval.
Phase I Vapor Adaptor	No Indication of Leaks Using Liquid Leak Detection Solution (LDS) or Bagging		Spec.	LDS or Bagging
Phase I Vapor Adaptor Dynamic Pressure Drop	Pressure Drop at 300, 400, & 500 gpm Specification to be Established During Certification Process		Spec.	TP-201.2B
Phase I Product and Vapor Adaptors	≤ 108 pound-inch (9 pound-foot)  Static Torque	<u>3.4</u>	Spec.	<u>TP-201.1B</u>

Table 3-1

Phase I Performance Standards and Specifications

APPLICABLE TO ALL VAPOR RECOVERY SYSTEMS

Performance Type	Requirement	Sec.	Std. Spec.	Test Procedure
UST Vent Pipe Pressure/Vacuum Relief Valves	Pressure Settings $3.0 \pm 0.5$ inches $H_2O$ Positive Pressure $8.0 \pm 2.0$ inches $H_2O$ Negative Pressure Leakrate at +2.0 inches $H_2O \le 0.17$ CFH Leakrate at -4.0 inches $H_2O \le 0.21$ CFH Total Additive Leakrate from All P/V Valves $\le 0.17$ CFH at 2.0 inches $H_2O$	3.5	Spec.	TP-201.2B
Containment Box Drain Valves	Leakrate ≤ 0.17 CFH at +2.0 inches H <sub>2</sub> O		Spec.	TP-201.2B TP-201.1C TP-201.1D
Containment Boxes	Leakrate at +2.0 inches H <sub>2</sub> O ≤ 0.17 CFH  No Standing Fuel in Box	3.6	Spec.	TP-201.2B Visual
Vapor Connectors and Fittings	No Indication of Leaks Using Liquid Leak Detection Solution (LDS) or Bagging	3.7	Spec.	LDS or Bagging
Compatibility with Fuel Blends	Materials shall be compatible with approved fuel blends	3.8	Spec.	Testing and Eng. Eval.

#### 3.1 Phase I Efficiency/Emission Factor

- 4.2.1 The minimum volumetric efficiency of Phase I systems shall be 98.0%. This shall be determined in accordance with TP-201.1 (Volumetric Efficiency of Phase I Systems at Dispensing Facilities).
- 4.2.1 The hydrocarbon emission factor for systems with processors shall not exceed 0.15 pounds per 1,000 gallons dispensed. This shall be determined in accordance with TP-201.1A (Emission Factor for Phase I Systems at Dispensing Facilities).

#### 3.2 Static Pressure Performance

The static pressure performance of Phase I vapor recovery systems not associated with Phase II systems shall be determined in accordance with TP-201.3 (Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities).

3.2.1 All Phase I systems shall be capable of meeting the performance standard in accordance with Equation 3-1.

The minimum allowable five-minute final pressure, with an initial pressure of two (2.0) inches H<sub>2</sub>O, shall be calculated as follows:

[Equation 3-1]

[delete equation below]

$$P_f = 2e^{\frac{-760.490}{v}}$$

[add the following corrected equation]

$$P_f = 2e^{\frac{-500^{\circ}.887}{V}}$$

Where:

 $P_f$  = The minimum allowable five-minute final pressure, inches H<sub>2</sub>O

V = The total ullage affected by the test, gallons

e = A dimensionless constant approximately equal to 2.718

2 = The initial starting pressure, inches H<sub>2</sub>O

#### 3.3 Phase I Drop-Tubes with Over-Fill Protection Devices

Phase I drop-tubes with over-fill protection devices installed shall have leak rate not to exceed 0.17 cubic feet per hour (0.17 CFH) at a pressure of two inches water column (2.0"  $H_2O$ ). The leak rate shall be determined in accordance with  $\overline{TP-201.2O}$   $\overline{TP-201.1D}$  (Pressure Integrity of Drop Tube Overfill Protection Devices). Drop-tubes that do not have an over-fill protection device shall not leak.

#### 3.4 Phase I Product and Vapor Recovery and Product Adaptors

- 3.4.1 The vapor recovery and product adaptors shall not leak. The vapor recovery and product adaptors, and the method of connection with the delivery elbow, shall be designed so as to prevent the over-tightening or loosening of fittings during normal delivery operations. This may be accomplished by installing a swivel connection on either the storage tank (rotatable adaptor) or delivery elbow side of the equipment, or by anchoring the product and vapor adaptors in such a way that they are not rotated during deliveries, provided the anchoring mechanism does not contribute undue stress to other tank connections. If a delivery elbow with a swivel connection is the preferred method, only cargo tank trucks with those elbows shall deliver to the facility.
- 3.4.2 Phase I product adaptors shall be manufactured in accordance with the cam and groove specification as shown in Figure 3A. Phase I vapor recovery adaptors shall be manufactured in accordance with the cam and groove

- specification as specified in the Commercial Item Description CID A-A-59326 (shown in Figure 3B). These specifications shall be applicable only to new adaptors and shall not be applied to in-use adaptors.
- 3.4.2 3.4.3 Phase I vapor recovery adaptors shall have a poppet. The poppet shall not leak when closed. The absence of vapor leaks may be verified by the use of commercial liquid leak detection solution, or by bagging, when the vapor containment space of the underground storage tank is subjected to a non-zero gauge pressure. (Note: leak detection solution will detect leaks only when positive gauge pressure exists.)
- 3.4.3 3.4.4 The Phase I vapor adaptor shall have performance specifications for the maximum pressure drop at 300, 400 and 500 gallons per minute (gpm) (± 50. gpm). The specifications shall be documented by the applicant and verified during the certification process.
- 3.4.5 The static torque of product and vapor recovery adaptors shall not exceed 108 pound-inch (9 pound-foot) when measured in accordance with TP-201.1B.

#### 3.5 Pressure/Vacuum Relief Vent Valves

The Executive Officer shall certify only those vapor recovery systems equipped with a pressure/vacuum (P/V) relief valve(s) on the underground storage tank vent pipe(s). Compliance with the P/V valve requirements set forth below shall be determined by TP-201.2B, Appendix 1.

- 3.5.1 The pressure settings for P/V valves shall be:

  Positive pressure setting of  $3.0 \pm 0.5$  inches H<sub>2</sub>O.

  Negative pressure setting of  $8.0 \pm 2.0$  inches H<sub>2</sub>O.
- 3.5.2 The leak rates for P/V valves, including connections, shall be less than or equal to:
  - 0.17 CFH at +2.0 inches  $H_2O$ . 0.21 CFH at -4.0 inches  $H_2O$ .
- 3.5.3 The total additive leakrate of all P/V valves installed on any vapor recovery system, including connections, shall not exceed 0.17 CFH at 2.0 inches H<sub>2</sub>O. This may be accomplished by manifolding the tank vent pipes into a single P/V valve or, alternatively, by choosing P/V valves certified to a more restrictive performance specification.

#### 3.6 Containment Boxes

3.6.1 Phase I containment boxes with drain valves shall not exceed a leak rate of 0.17 CFH at 2.0 inches H<sub>2</sub>O. Containment boxes with cover-actuated drain valves shall be tested both with the lid installed and with the lid removed. The leak rate shall be determined in accordance with TP-201.2B (Pressure Integrity of Vapor-Recovery Equipment). Phase I configurations installed so that liquid drained through the drain valve drains directly into the drop tube rather than the UST ullage shall be tested in accordance with TP-201.1C or TP-201.1D, whichever is applicable.

- 3.6.2 Drain valves shall not be allowed in containment boxes used exclusively for Phase I vapor connections unless. Drain valves in containment boxes for Phase I product connections shall be allowed if required by other applicable regulations.
- 3.6.3 Containment boxes shall be maintained to be free of standing gasoline. Any gasoline spilled into, or found in, a containment box, shall be removed by the operator at the first opportunity that does not cause a safety hazard. The removal of gasoline shall be performed in accordance with the applicable requirements of the State Water Resources Control Board, the Department of Toxic Substance Control, and all other applicable regulations.
- 3.6.4 For any containment box that is not exclusively dedicated to the Phase I vapor connector, and that does not have a CARB-certified drain valve, a gasoline-compatible device for evacuating fuel from a containment box, such as a small hand pump, shall be maintained on site and available for use in every gasoline dispensing facility.

#### 3.7 Vapor Connections and Fittings

All vapor connections and fittings not specifically certified with an allowable leakrate shall not leak. The absence of vapor leaks may be verified by the use of commercial liquid leak detection solution, or by bagging individual components, when the vapor containment space of the underground storage tank is subjected to a non-zero gauge pressure. (Note: leak detection solution will detect leaks only when positive gauge pressure exists.) The absence of liquid leaks may be verified by visual inspection for seepage or drips.

#### 3.8 Materials Compatibility with Fuel Blends

Vapor recovery systems and components shall be compatible with any and all fuel blends in common use in California, including seasonal changes, and approved for use as specified in title 13, CCR, section 2260 et seq. Applicants for certification may request limited certification for use with only specified fuel blends. Such fuel-specific certifications shall clearly specify the limits and restrictions of the certification.

# Figures Proposed for Addition Figure 3A Product Adapter Cam and Groove Standard

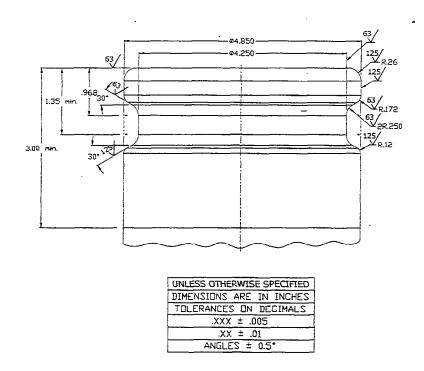
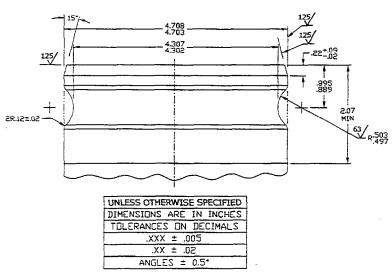


Figure 3B
Vapor Recovery Cam and Groove Standard



BASED ON
COMMERCIAL ITEM DESCRIPTION
CID A-A-59326
COUPLING HALF, MALE

### 4. PHASE II PERFORMANCE STANDARDS AND SPECIFICATIONS APPLICABLE TO ALL PHASE II VAPOR RECOVERY SYSTEMS

Table 4-1 summarizes the Phase II Performance Standards and Specifications applicable to all Phase II vapor recovery systems. Phase II vapor recovery systems shall be used only in facilities equipped with a certified Phase I system. Phase II systems are subject to all of the standards and specifications in Section 3, as well as those in any other applicable section.

Table 4-1
Phase II Performance Standards and Specifications
APPLICABLE TO ALL PHASE II VAPOR RECOVERY SYSTEMS

AFFLICABLE TO ALL FRASE II VAPOR RECOVERY SYSTEMS				
Performance Type	Requirement		Std Spec.	Test Procedure
Phase II Emission Factor Includes: Refueling and Vent Emissions Pressure-Related Fugitives	Summer Fuel: 95% Efficiency and HC ≤ 0.38 pounds/1,000 gallons Winter Fuel: 95% Efficiency or HC ≤ 0.38 pounds/1,000 gallons		Std.	TP-201.2 TP-201.2A TP-201.2F
Static Pressure Performance	In accordance with Section 4.2	4.2	Std.	TP-201.3
Spillage Including Drips from Spout	≤ 0.24 pounds/1,000 gallons	4.3	Std.	TP-201.2C TP-201.2E
ORVR Compatibility	Interaction of Refueling ORVR Vehicles Shall Not Cause the System to Exceed the applicable Efficiency or Emission Standard, Including ORVR Penetrations to 80%		Std.	Approved Procedure Developed by Mfg.
Phase II Compatibility with Phase I Systems	Phase II System Shall Not Cause Excess Emissions From Phase I Operations		Spec.	Testing and Eng. Eval.
UST Pressure Criteria (30 day rolling average)	Daily Average Pressure $\leq$ +0.25 in. H <sub>2</sub> O Daily High Pressure $\leq$ +1.50 in. H <sub>2</sub> O Non-Excluded Hours/Day = 0 $\pm$ 0.05 in. H <sub>2</sub> O		Spec.	Testing, Eng. Eval. and ISD
Nozzle Criteria Each Phase II Nozzle Shall:	Post-Refueling Drips ≤ 1 Drop/Refueling Have an OD ≤ 0.840 inches for 2.5 inches Be capable of fueling any vehicle that can be fueled with a conventional nozzle		Spec.	TP-201.2D Engineering Evaluation
Liquid Retention Nozzle "Spitting"	≤ 100 ml/1,000 gallons ≤ 1.0 ml per nozzle per test		Std.	TP-201.2E
Liquid Removal Systems	Capable of Removing 5 ml/ gal. (average)	4.9	Std.	TP-2021.6
Nozzle/Dispenser Compatibility	Vapor Check Valve Closed When Hung Hold-open Latch Disengaged When Hung	4.10	Spec.	Testing and Eng. Eval.

Table 4-1 (continued)
Phase II Performance Standards and Specifications
APPLICABLE TO ALL PHASE II VAPOR RECOVERY SYSTEMS

Performance Type	Requirement		Std Spec.	Test Procedure
Unihose MPD Configuration	One Hose/Nozzle per Dispenser Side	4.11	Spec.	Testing and Eng. Eval.
- Phase II Vapor Riser	Minimum 1" Nominal ID		Spec.	Testing and Eng. Eval.
Vapor Return Piping	No liquid or fixed blockage  Minimum 3" Nominal ID after first manifold  Recommended slope 1/4" per foot  Minimum slope 1/8" per foot  Rigid piping, or equivalent		Spec.	Testing and Eng. Eval.
Vapor Return Pipe Runs	The Maximum Allowable Lengths of Pipe Runs Shall Be Established During the Certification Process-		Spec.	Testing and Eng. Eval.
Liquid Condensate Traps	Shall have Automatic Evacuation System		Spec.	Testing and Eng. Eval.
Connectors and Fittings	No Indication of Vapor Leaks With Liquid Leak Detection Solution (LDS) or Bagging	4.14	Spec.	LDS or Bagging

#### 4.1 Phase II Emission Factor/Efficiency

4.1.1 The Hydrocarbon emission factor and/or efficiency for Phase II vapor recovery systems shall be determined as follows:

When testing conducted with gasoline meeting the requirements for summer fuel:

95% Efficiency and

Hydrocarbon emission factor not to exceed 0.38 pounds/1,000 gallons.

When testing conducted with gasoline meeting the requirements for winter -fuel:

95% Efficiency or

Hydrocarbon emission factor not to exceed 0.38 pounds/1,000 gallons.

The emission factor and/or efficiency shall demonstrate compliance with the standard when calculated for each of these test populations:

The entire population of 200 vehicles as defined in TP-201.2A

The vehicles defined as "ORVR vehicles" and

The vehicles defined as "non-ORVR vehicles."

4.1.2 The emission factor and/or efficiency shall be determined in accordance with TP-201.2 (Efficiency and Emission Factor for Phase II Systems) and shall include all refueling emissions, underground storage tank vent emissions and pressure-related fugitive emissions. Pressure-related fugitive emissions shall be determined in accordance with TP-201.2F (Pressure-Related Fugitive Emissions).

#### 4.2 Static Pressure Performance

The static pressure performance of Phase II systems, including the associated Phase I system, shall be determined in accordance with TP-201.3 (Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities).

- 4.2.1 All Phase II vapor recovery systems shall be capable of meeting the performance standard in accordance with Equation 4-1 or 4-2.
- 4.2.2 For Phase II Balance Systems, the minimum allowable five-minute final pressure, with an initial pressure of two (2.0) inches H<sub>2</sub>O, shall be calculated as follows:

#### [Equation 4-1]

-760 . 490	
$P_f = 2e^{-v}$	if $N = 1-6$
<del>-792 . 196</del>	
$P_f = 2e^{-v}$	if $N = 7-12$
<u>-824 . 023</u>	
$P_f = 2e^{-v}$	if N = 13-18
-855 . <del>974</del>	
$P_f = 2e^{-\overline{v}}$	if N = 19-24
-888 . 047	
$P_f = 2e^{\frac{-v}{v}}$	if N > 24

Where:

N = The number of affected nozzles. For manifolded systems, N equals the total number of nozzles. For dedicated plumbing configurations, N equals the number of nozzles serviced by the tank being tested.

 $P_f$  = The minimum allowable five-minute final pressure, inches H<sub>2</sub>O

V = The total ullage affected by the test, gallons

e = A dimensionless constant approximately equal to 2.718

2 = The initial starting pressure, inches  $H_2O$ 

4.2.3 For Phase II Vacuum Assist Systems, the minimum allowable five-minute final pressure, with an initial pressure of two (2.0) inches H<sub>2</sub>O, shall be calculated as follows:

#### [Equation 4-2]

$$P_{f} = 2e^{\frac{-500.887}{V}}$$
if N = 1-6
$$P_{f} = 2e^{\frac{-531.614}{V}}$$
if N = 7-12
$$P_{f} = 2e^{\frac{-562.455}{V}}$$
if N = 13-18
$$P_{f} = 2e^{\frac{-593.412}{V}}$$
if N = 19-24
$$P_{f} = 2e^{\frac{-624.483}{V}}$$
if N > 24

Where:

 N = The number of affected nozzles. For manifolded systems, N equals the total number of nozzles. For dedicated plumbing configurations,
 N equals the number of nozzles serviced by the tank being tested.

 $P_f$  = The minimum allowable five-minute final pressure, inches H<sub>2</sub>O

V = The total ullage affected by the test, galions

e = A dimensionless constant approximately equal to 2.718

2 = The initial starting pressure, inches  $H_2O$ 

4.2.4 Under no circumstances shall Phase II components be partially or completely immersed in water to check for pressure integrity.

#### 4.3 Spillage

The Executive Officer shall not certify vapor recovery systems that cause excessive spillage.

4.3.1 Spillage shall be determined in accordance with TP-201.2C (Spillage from Phase II Systems). The emission factor for spillage shall not exceed 0.24 pounds/1000 gallons dispensed, for each of the following three categories:

All refueling events;

Refueling operations terminated before activation of the primary shutoff; and

Refueling events terminated by activation of the primary shutoff.

4.3.2 The number of self-service refueling operations observed during certification testing of any system for spillage shall be not less than:

1,000 refueling operations [not including topoffs]; and

400 fill-ups [terminated by full tank shut-off, not including topoffs].

4.3.3 Increased spillage resulting from one top-off following the first activation of the automatic (primary) shutoff mechanism shall be subjected to failure mode testing. Nozzles that result in excessive spillage following one top off shall not be certified.

#### 4.4 Compatibility of Phase II Systems with Vehicles Equipped with ORVR Systems

- 4.4.1 Refueling vehicles equipped with onboard refueling vapor recovery (ORVR) systems shall not cause the system to exceed the Phase II emission factor as specified in section 4.1.
- 4.4.2 Compatibility shall be demonstrated for typical and worst case situations and vehicle populations, up to and including 80% ORVR-equipped vehicles. Actual vehicles shall be used whenever feasible. Simulations may be proposed for specific demonstrations. Any ORVR simulation protocols shall be approved by the Executive Officer prior to conducting the test.
- 4.4.3 The system manufacturer shall be responsible for developing a procedure by which compatibility can be demonstrated. This procedure is subject to engineering evaluation by the Executive Officer; if it is deemed inadequate and/or unusable, the certification application shall be deemed unacceptable.

#### 4.5 Compatibility of Phase II Systems with Phase I Systems

- 4.5.1 Phase II vapor recovery systems shall not cause excess emissions from Phase I systems. Emissions resulting from Phase I operations which are attributable to the design or anticipated operation of the Phase II system shall not be discounted when determining the adequacy of the entire vapor recovery system.
- 4.5.2 Applicants for certification may, as a performance specification, limit the type of equipment with which their system is compatible. Any such specification shall become a condition of certification.

#### 4.6 Underground Storage Tank Pressure Criteria

Phase II systems that have underground storage tank (UST) pressures sufficient to cause potential fugitive emissions that exceed fifty percent (50%) of the maximum allowable emission factor shall not be certified. In addition, the following criteria shall apply to all Phase II systems.

4.6.1 The vapor recovery system pressure data shall be evaluated so that periods during which system pressure changes directly attributable to Phase I equipment or operations that do not comply with Sections 4.1.2 and/or 4.1.3 of CP-204 are not used to determine failure of the Phase II system to meet the system pressure criteria.

- 4.6.2 If the vapor recovery system pressure does not deviate from atmospheric pressure except for those excursions attributable to Phase I operations, the integrity of the vapor recovery system shall be presumed to be inadequate.
- 4.6.3 The daily average pressure shall be computed as follows:

Zero and negative pressure shall be computed as zero pressure; and Time at positive and zero pressures shall be included in the calculation.

(Example: 6 hours at +1.0 inches H<sub>2</sub>O and 18 hours at -1.0 inches H<sub>2</sub>O yields an average daily pressure of 0.25 inches H<sub>2</sub>O.)

4.6.3 4.6.4 A rolling 30 day average of the daily average positive-pressures and the daily high pressures for each day shall be calculated by averaging the most current daily value with the appropriate values for the previous 29 days. These 30-day rolling averages shall meet the following criteria:

The daily average pressure shall not exceed  $\pm 0.25$  inches H<sub>2</sub>O. The daily high pressure shall not exceed  $\pm 1.5$  inches H<sub>2</sub>O.

4.6.4 4.6.5 Pressure readings shall be taken at intervals no greater than 5 seconds.

These readings may be stored as one minute averages. Other methods of data collection and analysis may be used with prior approval of the Executive Officer

#### 4.7 Nozzle Criteria

- 4.7.1 Each vapor recovery nozzle shall be capable of refueling any vehicle that complies with the fillpipe specifications and can be fueled by a conventional nozzle.
- 4.7.2 Each vapor recovery nozzle shall be "dripless," meaning that no more than one drop shall occur following each refueling operation. This shall be determined in accordance with TP-201.2D (Post-Refueling Drips from Nozzle Spouts).
- 4.7.3 Each vapor recovery nozzle shall comply with the following:
  - (a) The terminal end shall have a straight section of at least 2.5 inches (6.34 centimeters) in length;
  - (b) The outside diameter of the terminal end shall not exceed 0.840 inch (2.134 centimeters) for the length of the straight section; and
  - (c) The retaining spring or collar shall terminate at least 3.0 inches (7.6 centimeters) from the terminal end.
- 4.7.4 Additional nozzle criteria are contained in Sections 5 and 6.

#### 4.8 Liquid Retention

- 4.8.1 Liquid retention in the nozzle and vapor path on the atmospheric side of the vapor check valve shall not exceed 100 ml per 1,000 gallons. This shall be determined in accordance with TP-201.2E (Gasoline Liquid Retention in Nozzles and Hoses).
- 4.8.2 Nozzle "spitting" shall not exceed 1.0 ml per nozzle per test and shall be determined in accordance with TP-201.2E (Gasoline Liquid Retention in Nozzles and Hoses).
- 4.8.3 The number of self-service refueling operations observed during certification testing of any system for liquid retention shall be not less than:
  - 10 refueling operations (not including topoffs); and
  - 4 fill-ups (terminated by automatic shut-off, not including topoffs).

#### 4.9 Liquid Removal Systems

Liquid removal systems are designed to evacuate liquid from the vapor passage of the hose. Such systems are required in configurations that would otherwise be subject to liquid blockage that creates increased emissions.

4.9.1 The liquid removal rate shall be determined in accordance with TP-201.6 (Determination of Liquid Removal of Phase II Vapor Recovery Systems of Dispensing Facilities). The minimum removal rate, averaged over a minimum of 4 gallons, shall equal or exceed 5 ml per gallon. The minimum dispensing rate for this requirement shall be specified during the certification process.

#### 4.10 Nozzle/Dispenser Compatibility

The nozzle and dispenser shall be compatible as follows:

- 4.10.1 The nozzle and dispenser shall be designed such that the vapor check valve is in the closed position when the nozzle is properly hung on the dispenser.
- 4.10.2 The nozzle and dispenser shall be designed such that the nozzle cannot be hung on the dispenser with the nozzle valves in the open position.

#### 4.11 Unihose MPD Configuration

There shall be only one hose and nozzle for dispensing gasoline on each side of a multi-product dispenser (MPD). This shall not apply to facilities installed prior to the effective date of this procedure unless the facility replaces more than 50 percent of the dispensers or makes a modification other than the installation of required sensors, that modifies over 50 percent of the vapor piping in the dispensers. Exception: dispensers which must be replaced due to damage resulting from an accident or vandalism may be replaced with the previously installed type of dispenser.

#### 4.12 Vapor Return Path

The requirements of Sections 4.12.1 through 4.13.2 for the vapor return piping and, if applicable, condensate traps, from the dispenser riser to the underground storage tank, shall apply to any facility installed after the effective date of this procedure.

- 4.12.1 The vapor return path from any fueling point to the underground storage tank shall be free of liquid blockage.
- 4.12.2 The Phase II riser shall have a minimum nominal internal diameter of one inch (1" ID). The connection between the Phase II riser and the dispenser shall be made with materials listed for use with gasoline, and shall have a minimum nominal 1" ID.
- 4.12.3 All new vapor return piping shall have a minimum nominal internal diameter of three inches (3" ID) from the point of the first manifold to the storage tank, including the float vent valve, if applicable. Facilities permitted by a local district prior to the adoption date of this procedure shall be required to meet the minimum three inch diameter standard only upon facility modifications requiring exposing at least 50 percent of the underground vapor return piping.
- 4.12.4 Wherever feasible, the recommended minimum slope of the vapor return piping, from the dispensers to the tank, shall be at least one-fourth (1/4) inch per foot of run. The minimum slope, in all cases, shall be at least one-eighth (1/8) inch per foot of run. The vapor return piping shall be constructed of rigid piping, or shall be contained within rigid piping, or shall have an equivalent method, approved by the Executive Officer, for ensuring that proper slope is achieved and maintained.
- 4.12.5 The Executive Officer shall determine by testing and/or engineering evaluation the maximum allowable length of vapor return piping for the system.

#### 4.13 Liquid Condensate Traps

Liquid condensate traps (also known as knockout pots and thief ports) are used to keep the vapor return piping clear of liquid when it is not possible to achieve the necessary slope from the dispenser to the underground storage tank.

- 4.13.1 Liquid condensate traps shall be used only when the minimum slope requirements of 1/8" per foot of run cannot be met due to the topography.
- 4.13.2 When condensate traps are installed, they shall be:
  - (a) certified by CARB;
  - (b) maintained vapor tight;
  - (c) accessible for inspection upon request;
  - (d) capable of automatic evacuation of liquid; and

(e) equipped with an alarm system in case of failure of the evacuation system.

#### 4.14 Connections and Fittings

All Phase II connections, fittings, or components not specifically certified with an allowable leakrate shall not leak. Vapor leaks may be determined by the use of commercial leak detection solution, or by bagging individual components, when the vapor containment space of the underground storage tank is subjected to a non-zero gauge pressure. (Note: leak detection solution will detect vapor leaks only when a positive gauge pressure exists). The absence of liquid leaks may be verified by visual inspection for seepage or drips.

### 5. PHASE II PERFORMANCE STANDARDS AND SPECIFICATIONS APPLICABLE TO BALANCE VAPOR RECOVERY SYSTEMS

Table 5-1 summarizes the performance standards and specifications specifically applicable to Phase II Balance vapor recovery systems. These systems are also subject to all of the standards and specifications in Sections 3 and 4, and the applicable pertions of requirements in Sections 7 and 8.

Table 5-1
Phase II Performance Standards and Specifications
APPLICABLE TO PHASE II BALANCE VAPOR RECOVERY SYSTEMS

Performance Type	Requirement	Sec.	Std Spec.	Test Procedure
Nozzle Criteria Each Balance Nozzle Shall:	Have an Insertion Interlock Be Equipped with a Vapor Check Valve	5.1	Spec.	Testing and Eng. Eval.
Insertion Interlock	Verification of No Liquid Flow Prior to Bellows Compression	5.1	Spec.	Testing and Eng. Eval.
Vapor Check Valve Leakrate	≤ 0.07 CFH at 2.0 inches H <sub>2</sub> O	5.1 <sup>-</sup>	Spec.	TP-201.2B
Bellows Insertion Force	Pounds (force) to Retaining Device Specified During Certification Testing	5.1	Spec.	Testing and Eng. Eval.
Nozzle Pressure Drop	$\Delta P$ at 60 CFH of N <sub>2</sub> $\leq$ 0.08 inches H <sub>2</sub> O	5.2	Std.	TP-201.2B
Hose Pressure Drop [Including Whip Hose]	$\Delta P$ at 60 CFH of $N_2 \le 0.09$ inches $H_2O$	5.2	Std.	TP-201.2B
Breakaway Pressure Drop	$\Delta P$ at 60 CFH of $N_2 \le 0.04$ inches $H_2O$		Std.	TP-201.2B
Dispenser Pressure Drop	$\Delta P$ at 60 CFH of N <sub>2</sub> $\leq$ 0.08 inches H <sub>2</sub> O		Std.	TP-201.2B
Swivel Pressure Drop	$\Delta P$ at 60 CFH of N <sub>2</sub> $\leq$ 0.01 inches H <sub>2</sub> O		Std.	TP-201.2B
Pressure Drop Phase II Riser to Tank [Including Vapor Impact Valve)	$\Delta P$ at 60 CFH of $N_2 \le 0.05$ inches $H_2O$		Std.	TP-201.4
Pressure Drop from Nozzie to UST	$\Delta P$ at 60 CFH of $N_2 \le 0.35$ inches $H_2O$ $\Delta P$ at 80 CFH of $N_2 \le 0.62$ inches $H_2O$		Std.	TP-201.4

#### 5.1 Balance Nozzle Criteria

Nozzles for use with balance systems shall comply with all of the criteria in Section 4.7, as well as all the criteria below.

- 5.1.1 Each balance nozzle shall have an insertion interlock designed to prevent the dispensing of fuel unless there is an indication that the nozzle is engaged in the fillpipe (i.e., the nozzle bellows is compressed). The performance specifications for the insertion interlock mechanism shall be established during the certification process.
- 5.1.2 Each balance nozzle shall be equipped with a vapor check valve. The leakrate for the vapor check valve shall not exceed 0.07 CFH at a pressure of 2.0 inches H<sub>2</sub>O.
- 5.1.3 The force necessary to compress the nozzle bellows to the retaining device, or a specified distance, shall be established during certification testing.

#### 5.2 Dynamic Pressure Drop Criteria for Balance Systems

- 5.2.1 The dynamic pressure drop for balance systems shall be established in accordance with TP-201.4 (Dynamic Pressure Performance of Vapor Recovery Systems of Dispensing Facilities). The dynamic pressure drop standards from the tip of the nozzle spout to the underground storage tank, with the Phase I vapor poppet open, shall not exceed the following:
  - 0.35 inches  $H_2O$  at a flowrate of 60 CFH of Nitrogen; and 0.62 inches  $H_2O$  at a flowrate of 80 CFH of Nitrogen.
- 5.2.2 The dynamic pressure drop for balance system components, measured at a flowrate of 60 CFH of Nitrogen, shall not exceed the following:

Nozzle: 0.08 inches  $H_2O$  Hose (Including Whip Hose): 0.09 inches  $H_2O$  Breakaway: 0.04 inches  $H_2O$  Dispenser: 0.08 inches  $H_2O$  Swivel: 0.01 inches  $H_2O$  Phase II Riser to UST: 0.05 inches  $H_2O$ 

The applicant may request to be certified to a dynamic pressure lower than those specified above. This shall be specified in the application and verified during certification testing.

### 6. PHASE II PERFORMANCE STANDARDS AND SPECIFICATIONS APPLICABLE TO ALL ASSIST VAPOR RECOVERY SYSTEMS

Table 6-1 summarizes the performance standards and specifications specifically applicable to Phase II Assist vapor recovery systems. These systems are also subject to all of the standards and specifications in Sections 3, 4 and the applicable ef-requirements in Sections 7 and 8.

Table 6-1

Phase II Performance Standards and Specifications

APPLICABLE TO ALL PHASE II VACUUM ASSIST SYSTEMS

Performance Type	Requirement		Std. Spec.	Test Procedure
Nozzle Criteria Each Assist Nozzle Shall:	Possess a Mini-Boot Have an Integral Vapor Check Valve		Spec.	Testing and Eng. Eval.
Nozzle Vapor Check Valve Leakrate	≤ 0.038 CFH at +2.0 inches H <sub>2</sub> O ≤ 0.10 CFH at –100 inches H <sub>2</sub> O		Spec.	TP-201.2B
Nozzle Pressure Drop Specifications ∆P at Specified Vacuum Level	Established During Certification Process		Spec.	TP-201.2B
Maximum Air to Liquid Ratio	1.00 (without processor) 1.30 (with processor)		Std.	TP-201.5
Air to Liquid Ratio Range	Established During Certification Process	6.2	Spec.	TP-201.5

#### 6.1 Nozzle Criteria

- 6.1.1 Nozzles for use with assist systems shall comply with all of the criteria in Section 4.7, as well as all the criteria below.
- 6.1.2 Each assist nozzle shall be equipped with a mini-boot that both allows for a lower A/L ratio and minimizes the quantity of liquid gasoline exiting the fillpipe during a spitback event.
- 6.1.3 Each assist nozzle shall be equipped with a vapor check valve. The leakrate for the vapor check valve shall not exceed the following:
  - 0.038 CFH at a pressure of +2.0 inches  $H_2O$ ; and 0.10 CFH at a vacuum of -100 inches  $H_2O$ .
- 6.1.4 The nozzle pressure drop shall be specified by the applicant and verified during the certification process.

#### 6.2 Air to Liquid Ratio

The air to liquid (A/L) ratio shall be specified by the applicant and verified during the certification process in accordance with TP-201.5 (Air to Liquid Volume Ratio). The maximum A/L shall not exceed the following:

- 1.00 (without processor); and
- 1.30 (with processor).

### 7. PHASE II PERFORMANCE STANDARDS AND SPECIFICATIONS APPLICABLE TO ASSIST SYSTEMS UTILIZING A CENTRAL VACUUM UNIT

Table 7-1 summarizes the performance standards and specifications specifically applicable to Phase II Assist vapor recovery systems utilizing a Central Vacuum Unit. These systems are also subject to all of the standards and specifications in Sections 3, 4, 6 and, if applicable, Section 8.

Table 7-1

Phase II Performance Standards and Specifications

APPLICABLE TO ALL PHASE II ASSIST SYSTEMS

UTILIZING A CENTRAL VACUUM UNIT

Performance Type	Requirement	Sec.	Std. Spec:	Test Procedure
Specification of Minimum and Maximum Vacuum Levels	Established During Certification Process	7.1	Spec.	Testing and Eng. Eval.
Number of Refueling Points Per Vacuum Device	Established During Certification Process Failure Mode Testing	7.2	Spec.	TP-201.5

#### 7.1 Vacuum Levels Generated by the Collection Device

The normal operating range of the system shall be specified by the applicant and verified during the certification process, and the maximum and minimum vacuum levels shall be specified in the certification Executive Order. The applicant may propose failure mode testing to extend the limits of the operating range.

#### 7.2 Maximum Number of Refueling Points per Vacuum Device

The maximum number of refueling points that can be adequately associated with the vacuum device, including meeting the A/L limits, shall be verified during certification testing. The test shall be conducted with all of the refueling points except one using the same fuel grade, and the refueling point on which the effectiveness is being tested using a different fuel grade. An engineering evaluation followed by certification testing shall demonstrate the system's ability to meet the required A/L ratio and/or emission factor with a self-adjusting submersible turbine pump (STP).

## 8. PHASE II PERFORMANCE STANDARDS AND SPECIFICATIONS APPLICABLE TO ASSIST SYSTEMS UTILIZING A DESTRUCTIVE OR NON-DESTRUCTIVE PROCESSOR

Tables 7-1 and 8-2 summarize the performance standards and specifications specifically applicable to Phase II Assist vapor recovery systems utilizing a processor. These systems are also subject to all of the standards and specifications in Sections 3 and 4 and, the applicable of Sections 5, 6, and 7.

Table 8-1

Phase II Performance Standards and Specifications

APPLICABLE TO ALL PHASE II ASSIST SYSTEMS

UTILIZING A DESTRUCTIVE PROCESSOR

Performance Type	Requirement	Sec.	Std. Spec.	Test Procedure
Hazardous Air Pollutants (HAPS) from the processor	HAPS from the Processor Shall Not Exceed these Limits: 1,3-Butadiene: 1.2 lbs/year Formaldehyde: 36 lbs/year Acetaldehyde: 84 lbs/year	8.1, 8.2	Std.	TP-201.2H
Maximum HC Rate to Processor	≤ 5.7 lb/1,000 gallons	8.3	Spec.	Testing and Eng. Eval.
Typical Load on Processor	Established during Certification	8.4	Spec.	Testing and Eng. Eval.
Processor Operation Time	Established during Certification	8.5	Spec.	Testing and Eng. Eval.

Table 8-2
Phase II Performance Standards and Specifications
APPLICABLE TO ALL PHASE II ASSIST SYSTEMS
UTILIZING A NON-DESTRUCTIVE PROCESSOR

Performance Type	Requirement	Sec.	Std. Spec.	Test Procedure
Maximum HC Rate to . Processor	≤ 5.7 lb/1,000 gallons	8.3	Spec.	Testing and Eng. Eval.
Typical Load on Processor	Established during Certification	8.4	Spec.	Testing and Eng. Eval.
Processor OperationTime	Established during Certification	8.5	Spec.	Testing and Eng. Eval.

#### 8.1 Processor Emission Factors

The emission factors shall be established in accordance with TP-201.2 (Efficiency and Emission Factor for Phase II Systems).

#### 8.2 Hazardous Air Pollutants from Destructive Processors

Hazardous Air Pollutants (HAPS) from the processor shall not exceed the following limits:

1,3-Butadiene:1.2 pounds per year36 pounds per yearAcetaldehyde:84 pounds per year

The emission factor shall be established in accordance with TP-201.2H (Determination of Hazardous Air Pollutants from Vapor Recovery Processors).

#### 8.3 Maximum Hydrocarbon Feedrate to the Processor

The maximum Hydrocarbon feedrate to the processor shall not exceed 5.7 pounds per 1,000 gallons.

#### 8.4 Typical Load on the Processor

The typical load on the processor shall be identified by the applicant and verified during the certification process, and shall be included in the specifications in the certification Executive Order.

#### 8.5 Processor Operation Time

The typical processor operation time shall be identified by the applicant and verified during the certification process, and shall be included in the specifications in the certification Executive Orders.

#### 9. ADDITIONAL REQUIREMENTS OF CERTIFICATION

#### 9.1 Financial Responsibility

The adequacy of the (1) methods of distribution, (2) replacement parts program, (3) financial responsibility of the applicant and/or manufacturer, and (4) other factors affecting the economic interests of the system purchaser shall be evaluated by the Executive Officer and determined by him or her to be satisfactory to protect the purchaser. A determination of financial responsibility by the Executive Officer shall not be deemed to be a guarantee or endorsement of the manufacturer or applicant.

Each applicant submitting a system and/or component for certification shall be charged fees not to exceed the actual cost of evaluating and testing the system to determine whether it qualifies for certification. The applicant is required to demonstrate ability to pay the cost of testing prior to certification and performance

testing. This may take the form of posting a bond of not less than \$20,000. An Executive Order certifying the system shall not be issued until the CARB certification fee has been paid in full.

#### 9.2 Warranty

The requirements of this section shall apply with equal stringency both to the original applicant and to rebuilders applying for certification. For systems that include components not manufactured by the applicant, the applicant shall provide information that shows that all components meet the following requirements.

- 9.2.1 The applicant and/or manufacturer of vapor recovery system equipment shall provide a warranty for the vapor recovery system and components, including all hanging hardware, to the initial purchaser and any subsequent purchaser within the warranty period. This warranty shall include the ongoing compliance with all applicable performance standards and specifications. The applicant and/or manufacturer may specify that the warranty is contingent upon the use of trained installers.
- 9.2.2 The minimum warranty shall be for one year from the date of installation of all systems and components. The applicant may request certification for a warranty period exceeding the minimum one-year requirement.
- 9.2.3 The manufacturer of any vapor recovery system or component shall affix a warranty tag to certified equipment that shall be removed only by the owner/operator of the vapor recovery equipment. The tag shall contain at least the following information.
  - (a) Notice of warranty period;
  - (b) Date of manufacture, or where date is located on component;
  - (c) Shelf life of equipment or sell-by date, if applicable;
  - (d) A statement that the component was factory tested and met all applicable performance standards and specifications; and
  - (e) A listing of the performance standards and/or specifications to which it was certified.
- 9.2.4 The Executive Officer shall certify only those systems which, on the basis of an engineering evaluation of such system's component qualities, design, and test performance, can be expected to comply with such system's certification conditions over the one-year warranty period specified above.

#### 9.3 Installation, Operation and Maintenance of the System.

Systems requiring unreasonable maintenance or inspection/maintenance frequencies, as determined by the Executive Officer, shall not be certified. The manufacturer of any vapor recovery system or component shall be responsible for developing manual(s) for all installation, operation and maintenance procedures.

This manual(s) shall be reviewed during the certification process and the certification shall not be issued until the Executive Officer has approved the manual(s).

- 9.3.1 The manual(s) shall include all requirements for the proper installation of the system and/or component. The manual(s) shall include recommended maintenance and inspection procedures and equipment performance procedures, including simple tests the operator can use to verify that the system or component is operating in compliance with all applicable requirements. The Executive Officer may require the inclusion of additional procedures.
- 9.3.2 No changes shall be made to CARB-approved manuals without the Executive Officer's prior written approval.
- 9.3.3 The equipment manufacturer shall be responsible for taking all reasonable and necessary steps to ensure that, at the time the system or component is installed, the owner/operator of the facility is provided with a copy of the appropriate manual(s) and any training specified in the applicable Executive Order.

#### 9.4 Identification of System Components

- 9.4.1 All components for vapor recovery systems shall be permanently identified with the manufacturer's name, part number, and a unique serial number. This requirement does not apply to replacement subparts of the primary component. Specific types of components may be exempted from this requirement if the Executive Officer determines, in writing, that this is not feasible.
- 9.4.2 Nozzle serial numbers shall be permanently affixed to, or stamped on, the nozzle body and easily accessible for inspection. The location of the serial number shall be evaluated by the Executive Officer prior to certification.

#### 10. IN-STATION DIAGNOSTIC SYSTEMS

Specific requirements for an ISD system are listed in the CP-201 ISD Appendix. Gasoline dispensing facilities that dispense less than or equal to 160,000 gallons per year are exempted from ISD requirements.

#### 11. APPLICATION PROCESS

All of the information specified in the following subsections shall be submitted to the Executive Officer for an application to be evaluated. An application for certification of a Phase I or Phase II vapor recovery system may be made to the Executive Officer by any applicant.

The applicant for certification shall identify, in the preliminary application, the standard(s) or specification(s) with which the system complies, and demonstrate that the proposed

system meets the primary performance standard(s) or specification(s) required by sections 3 through 8 of this Procedure. For the preliminary application, the applicant shall have performed tests for all applicable performance specifications and standards. Engineering reports of successful test results for all these tests must be included in the preliminary application. In order to expedite the application process, the Executive Officer may determine that the application is acceptable based on the results of abbreviated operational and/or efficiency/emission factor testing. Test results shall be submitted for an operational test of at least 30 days, and for a test of at least 50 vehicles demonstrating adequate collection, or equivalent verification that the system is capable of meeting the performance standards and specifications. The system, as characterized by these reports. shall be subjected to an engineering analysis. If the preliminary application is deemed acceptable, the applicant shall be notified and shall expeditiously install the system for certification testing. If the preliminary application is deemed unacceptable, it shall be returned to the applicant with the deficiencies identified. The final application shall not be deemed complete until it contains the results of all necessary testing, the approvals of other agencies, the finalized operating and maintenance manuals, and all other requirements of certification.

Applications for non-system-specific components shall only include the applicable subsections as determined by the Executive Officer.

Applications shall be evaluated and the applicant shall be notified of the determination within the time periods indicated below. The time periods may be extended by the Executive Officer for good cause.

Table 11-1
Time Requirements for the Certification Application Process

Action	Time	Determination	CARB Response
Preliminary Application Filed	60 days	Acceptable	Preliminary I Application Accepted Test Site Approval Granted
Preliminary Application Filed	60 days	Unacceptable	Preliminary Application Returned with Notation of Deficiencies
Application Resubmitted	30 days	Acceptable	Preliminary Re-Application Accepted Test site Approved
Application Resubmitted	30 days	Unacceptable	Initial Re-Application Returned with Notation of Deficiencies
Final Application Complete	120 days	Acceptable	Executive Officer Issues Certification Executive Order
Final Application Complete	120 days	Unacceptable	Executive Officer Denies Certification

The application shall be written and signed by an authorized representative of the applicant, and shall include all of the items listed below.

- (a) Description of Vapor Recovery System (§11.1)
- (b) Description of In-Station Diagnostics System (§11.2)
- (c) Materials Compatibility with Fuels (§11.3)
- (d) Evidence of Compatibility of the System (§11.3)
- (e) Evidence of Reliability of the System (§11.4)
- (f) Installation and Maintenance Requirements of the System (§11.5)
- (g) Evidence of Financial Responsibility of the Applicant (§11.6)
- (h) A copy of the warranty (§11.7)
- (i) Request for and information about proposed test station (§11.8)
- (j) Notification of System Certification Holder, if applicable (§11.9)
- (k) Other Information such as the Executive Officer may reasonably require. (§11.10)

#### 11.1 Description of Vapor Recovery System

The application shall include a complete description of the system concept, design and operation, including, but not limited to, the following items.

- 11.1.1 Identification of critical system operating parameters
- 11.1.2 Engineering drawings of system, components, and underground piping and tank configurations for which certification is requested.
- 11.1.3 Engineering parameters for dispenser vapor system control boards and/or all vapor piping, pumps, nozzles, hanging hardware, vapor processor, etc.
- 11.1.4 Listing of components and evidence that the manufacturers of any components intended for use with the system and not manufactured by the applicant have been notified of the applicant's intent to obtain certification.
- 11.1.5 Applicable performance standards and specifications of components, specifically identifying those which exceed the minimum acceptable specifications and for which certification of superior performance is requested, and test results demonstrating compliance with these specifications.
- 11.1.6 Results of tests demonstrating that the system and components meet all the applicable performance standards. These tests shall be conducted by, or at the expense of, the applicant.
- 11.1.7 If the application is for an innovative system, the applicant shall identify the performance standard(s) or specification(s) with which the system does not comply. The applicant shall supply any necessary alternative test procedures, and the results of tests demonstrating that the system complies with the emission factor.

- 11.1.8 Any additional specifications of the system including, but not limited to, underground pipe sizes, lengths, fittings, volumes, material(s), etc.
- 11.1.9 Estimated retail price of the system.
- 11.1.10 For previously tested systems, identification of any and all new components and physical and operational characteristics, together with new test results obtained by the applicant.

#### 11.2 Description of In-Station Diagnostics (ISD)

The applicant shall supply information about the ISD as specified in Section 8 of the CP-201 ISD Appendix.

#### 11.3 Compatibility

- 11.3.1 The applicant shall submit evidence of system compatibility, including the following:
- 11.3.2 A procedure developed by the applicant for demonstrating compatibility between the Phase II vapor recovery system and ORVR-equipped vehicles shall be submitted, along with the test results demonstrating compatibility. The procedure shall comply with the provisions in Section 4.4.
- 11.3.3 Evidence demonstrating the compatibility of the Phase II system with any type of Phase I system with which the applicant wishes the Phase II system to be certified, as specified in Section 4.5. Continuous recordings of pressure recordings in the underground storage tank, as well as failure mode tests, may be used for this demonstration.
- 11.3.4 Evidence that the system can fuel any vehicle meeting state and federal fillpipe specifications and capable of being fueled by a non-vapor-recovery nozzle.
- 11.3.5 The applicant shall provide information regarding the materials specifications of all components, including evidence of compatibility with all fuels in common use in California and approved as specified in Section 3.8. If the applicant is requesting a certification for use only with specified fuel formulations, the applicant shall clearly identify, in the application, the included and excluded fuel formulations for which certification is requested.

#### 11.4 Reliability of the System

In order to ensure ongoing compliance, adequately protect public health, and protect the end-user, the reliability of the system shall be addressed in the application, including the following:

- 11.4.1 The expected life of system and components.
- 11.4.2 Description of tests conducted to ascertain compliance with performance standards and specifications for the expected life of the system or component, any procedures or mechanisms designed to correct problems, and test results.
- 11.4.3 Identification of and emission impact of possible failures of system, including component failures
- 11.4.4 Procedure and criteria for factory testing (integrity, pressure drop, etc.)

#### 11.5 Installation and Maintenance of the System

The installation and maintenance plan shall be submitted, and shall include at least the following items:

- 11.5.1 Installation and maintenance manuals of the system, including the ISD.
- 11.5.2 A plan for training installers in the proper installation of the system.
  - 11.5.3 A replacement parts program.
  - 11.5.4 The estimated installation costs and yearly maintenance costs.

#### 11.6 Evidence of Financial Responsibility

The applicant shall submit evidence of financial responsibility to ensure adequate protection to the end-user of the product as specified in Section 9.

#### 11.7 Warranty

The applicant shall submit a copy of the warranty for the system, warranties for each component, and samples of component tags or equivalent method of meeting warranty requirements as specified in Section 9.

#### 11.8 Test Station

- 11.8.1 The vapor recovery system shall be installed and tested in an operating gasoline dispensing facility for the purpose of certification testing.
- 11.8.2 The applicant shall make arrangements for the vapor recovery system to be installed in an operating gasoline dispensing facility meeting the requirements of Section 13.1.
- 11.8.3 The request for designation as a test site shall include the following information:
  - (a) Location of the facility;

- (b) Verification of throughput for at least six months; and
- (c) Hours of operation.
- 11.8.4 The applicant shall submit final construction diagrams of the proposed test station. These drawings shall clearly identify the type of vapor recovery piping and connections, pipe slope, and type of storage tanks (i.e., single or double wall, steel, fiberglass, etc.). The Executive Officer may require Professional Engineer or Architect Approved As-Built drawings of the test site. If such drawings are not obtainable, the applicant may petition the Executive Officer to accept alternatives sources of this information, such as detailed schematics of the vapor piping configuration and/or photographs clearly identifying underground components.

#### 11.9 Notification of System Certification Holder

If the applicant is not the manufacturer of all system components, the applicant shall include evidence that the applicant has notified the component manufacturer(s) of the applicant's intended use of the component manufacturers' equipment in the vapor recovery system for which the application is being made.

- 11.9.1 When the applicant is requesting inclusion of one or more components on a certified system, the applicant shall notify the manufacturer, if any, named as the applicant or holder of the executive order for the certified system.
- 11.9.2 When the applicant is requesting certification of one or more components as part of a new system, the applicant shall notify all manufacturers.

#### 11.10 Other Information

The applicant shall provide any other information that the Executive Officer may reasonably deem necessary.

#### 12. ENGINEERING EVALUATION OF VAPOR RECOVERY SYSTEMS

The application for certification of all systems and components shall be subjected to an evaluation.

Any system or component not meeting the requirements of the engineering evaluation shall be denied certification and the preliminary application shall be returned to the system or component manufacturer with the reason for failure. Resubmittal of a system, or component, for certification shall not be granted until the system or component deficiencies identified during the initial engineering evaluation have been addressed and corrected. All testing conducted after the preliminary application has been deemed acceptable shall be evaluated, and adjustments shall be made to the certification process as necessary. The final application shall be reviewed and deemed complete prior to the issuance of certification.

The evaluation of the application shall include, but is not limited to, subsections 12.1 through 12.6.

#### 12.1 Performance Standards and Specifications

The system and component performance standards and specifications identified by the applicant shall be reviewed to ensure that they include and conform to the applicable standards and specifications in Sections 3 through 8 of this Procedure.

#### 12.2 Bench and Operational Testing Results

The procedures for, and results of, bench testing and operational testing contained in the application shall be reviewed. The review shall determine if the procedures adhere to required methodology and ensure that the results meet or exceed the standards and specifications in Sections 3 through 8 of this Procedure. The evaluation shall include a determination of necessary verification testing.

#### 12.3 Evaluation of System Concept

The system concept shall be evaluated to ensure that it is consistent with the generally accepted principles of physics, chemistry, and engineering.

#### 12.4 Materials Specifications and Compatibility with Fuel Formulations

The component materials specifications shall be reviewed to ensure chemical compatibility with gasoline and/or any oxygenates that may be present in gasoline on an ongoing or on a seasonal basis, as specified in Section 3.8. This review shall include consideration of the variations in gasoline formulations for octane differences and summer fuel and winter fuel.

#### 12.5 Installation and Maintenance Manuals

The installation and maintenance manuals for the system and components shall be reviewed for completeness. Routine maintenance procedures shall be reviewed to ensure adequacy and determine that the procedures are not unreasonable.

#### 12.6 Failure Mode Procedures and Test Results

All failure mode test procedures, and the results of tests conducted by the applicant, shall be reviewed. Additionally, all failure mode testing conducted during the certification process to verify the test results or further evaluate the systems shall be similarly reviewed.

#### 13. VAPOR RECOVERY SYSTEM CERTIFICATION TESTING

The Executive Officer shall conduct, or shall contract for and observe, evaluation and testing of vapor recovery systems conducted for the purpose of certification. Except as otherwise specified in Section 14 of this procedure, vapor recovery systems shall be

subjected to evaluation and testing pursuant to the appropriate performance standards performance specifications, and test procedures specified in Sections 3 through 8 of this procedure.

Certification testing of vapor recovery systems shall be conducted only after the application for certification has been found to be complete. Some tests may be conducted more than once, to characterize the performance of systems and/or system components over time.

Any applicant or representative of an applicant found to have performed unauthorized maintenance, or to have attempted to conceal or falsify information, including test results and/or equipment failures, may be subject to civil and criminal penalties and testing of the system or component shall be terminated.

#### 13.1 Test Site for Field Testing of Vapor Recovery Systems

The applicant shall make arrangements for the vapor recovery system to be installed in one or more operating GDFs for certification testing, and the applicant shall request, in writing, approval of the GDF as a test site from the Executive Officer. Upon determining that the GDF meets all of the following criteria, the Executive Officer shall, in writing, designate the selected location as a test site, and exempt it from any local district prohibition against the installation of uncertified equipment. Except as otherwise provided in Section 16 of this procedure, the vapor recovery system shall be installed throughout the entire facility. The Executive Officer may require that the system be installed in more than one facility for the purpose of testing.

- 13.1.1 The test station shall have a minimum throughput of 150,000 gallons/month. The Executive Officer may, for good cause, grant approval of a test station with lower throughput, provided that the throughput is at least 100,000 gallons/month, and that all necessary testing can be conducted at that facility.
- 13.1.2 The station shall be located within 100 miles of the CARB offices. When a suitable location for testing cannot be located within 100 miles of the CARB offices, the Executive Officer may, for good cause, grant approval of a test station elsewhere, provided that all the necessary testing can be conducted at that location. The applicant shall be responsible for any additional costs, such as travel, associated with that location.
- 13.1.3 Continuous access to the test site by CARB staff, without prior notification, shall be provided. Every effort will be made to minimize inconvenience to the owner/operator of the facility. If testing deemed necessary cannot reasonably be conducted, the facility shall be deemed unacceptable and the test shall be terminated.
- 13.1.4 If test status is terminated for any reason, uncertified equipment shall be removed within sixty days, unless the Executive Officer extends the time in

writing. The local district with jurisdiction over the facility may impose a shorter time.

- 13.1.5 All test data collected by the applicant at the test site shall be made available to the Executive Officer within fifteen (15) working days. The Executive Officer may specify the format in which the data is to be submitted.
- 13.1.6 Test site designation may be requested by the applicant, or by another person, for facilities other than the certification test site(s), for the purpose of research and development, or independent evaluation of a system prior to its certification. Approval of such a test site shall be at the discretion of the Executive Officer. The test site shall be subject to all of the above conditions with the exception of 13.1.1 and 13.1.2.

#### 13.2 Bench Testing of Components

Components identified by the engineering evaluation as requiring bench testing to verify performance standards and specification shall be submitted to the Executive Officer prior to commencement of field testing. This testing may be repeated during and/or after the field testing.

#### 13.3 Operational Test of at Least 180 Days

All vapor recovery systems shall be subjected to an operational test of at least 180 days. Failure to comply with any of the requirements shall result in termination of the operational test. A new operational test may be commenced only after the applicant reapplies, with specific information regarding the cause of the failure and the action taken to correct it. The requirements of the operational test are listed below.

- 13.3.1 The duration of the test shall be at least 180 days, except as otherwise provided in Section 16.
- 13.3.2 No maintenance shall be performed other than that which is specified in the operating and maintenance manual. Such maintenance as is routine and necessary shall be performed only after notification of the Executive Officer. Occurrences beyond the reasonable control of the applicant, such as vandalism or accidental damage by customers (e.g., drive-offs), shall not be considered cause for failure of the systems.
- 13.3.3 Except where it would cause a safety problem, maintenance shall not be performed until approval by the Executive Officer has been obtained. In those situations that require immediate action to avoid potential safety problems, maintenance may be performed immediately and the Executive Officer notified as soon as practicable.
- 13.3.4 For the purpose of certification, the pressure in the underground storage tank (UST) shall be monitored and recorded continuously throughout the operational test. Testing to verify the integrity of the test station shall be conducted throughout the operational test period, at intervals not to exceed

thirty days. Only data collected during periods of pressure integrity shall be deemed valid. The average of no less than three thirty-consecutive-day periods of valid UST pressure data shall be used to verify that the system meets the standard, as specified in Sections 3 and 4. All pressure data shall be used to make this determination. If the system fails to meet the standard, the data may be examined, and the Executive Officer may exclude pressure excursions directly attributable to noncompliant Phase I equipment or operations.

13.3.5 Tests of the performance of the system and/or components shall be conducted periodically throughout the operational test period. If the results of such tests, when extrapolated through the end of the warranty period, show a change that results in the degradation of a performance standard or specification, the Executive Officer may extend or terminate the operational test.

#### 13.4 Failure Mode Testing

Additional failure mode test procedures may be required as needed.

#### 13.4.1 **ORVR Compatibility**

The Phase II vapor recovery system shall demonstrate the ability to fuel vehicles equipped with ORVR systems without difficulty and without causing the system to exceed the performance standard specified in Section 4.1. Various penetrations of ORVR-equipped vehicles shall be used or simulated to represent typical and worst case conditions. The test procedures used shall be those developed by the applicant, submitted as part of the application for certification, and accepted after engineering evaluation.

#### 13.4.2 **ISD System**

Failure mode testing for the ISD system is specified in the CP-201 ISD Appendix.

#### 13.5 Efficiency and/or Emission Factor Test

Testing to determine the efficiency and/or emission factor of the vapor recovery system shall be conducted in accordance with the applicable test procedures specified in Section 3 or Section 4 of this procedure. Additional testing may be required if the Executive Officer deems it necessary. The additional testing may include, but is not limited to the determination of the Reid Vapor Pressure of the fuel, the volume and/or mass in the vapor return path, fuel and/or tank temperature, and the uncontrolled emission factor.

13.5.1 Phase I Systems. A test of the static pressure integrity of the Phase I system may be conducted, in accordance with TP-201.3, no less than three days prior to conducting TP-201.1 or TP-201.1A. Testing, in accordance with TP-201.1 and/or TP-201.1A, shall be conducted at delivery rates typical and representative of the facilities for which certification is requested. More than

one test may be required to accomplish this determination. Certification may be limited to specified maximum loading rates. The integrity of the vapor recovery system shall be verified as soon as possible, but not more than 48 hours, after the completion of this test. Failure of the integrity test shall invalidate the TP-201.1 or TP-201.1A test results unless the Executive Officer determines that the integrity failure did not result in any significant unmeasured emissions.

13.5.2 **Phase II Systems**. A test of the static pressure integrity of the Phase II system shall be conducted, in accordance with TP-201.3, no more than seven days and no less than three days prior conducting TP-201.2. The integrity of the vapor recovery system, including all test equipment installed for the purpose of conducting TP-201.2, shall be verified as soon as possible, but not more than 48 hours, after the completion of this test. Failure of the integrity test shall invalidate the TP-201.2 test unless the Executive Officer determines that the integrity failure did not result in any significant unmeasured emissions.

#### 13.6 Vehicle Matrix

A representative matrix of 200 vehicles shall be used when testing to determine the Phase II efficiency for the performance standard. The composition of the representative vehicle matrix shall be determined for each calendar year by the Executive Officer in accordance with TP-201.2A (Determination of Vehicle Matrix for Phase II Systems).

- 13.6.1 Vehicles will be tested as they enter the dispensing facility ("first in" basis) until a specific matrix block of the distribution is filled.
- 13.6.2 The vehicle matrix shall include a population of ORVR-equipped vehicles consistent with the distribution of ORVR-equipped vehicles in the State of California.
- 13.6.3 The Executive Officer may exclude any vehicle that fails to comply with the vehicle fillpipe specifications ("Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks" incorporated by reference in title 13, CCR, section 2235).
- 13.6.4 The Executive Officer may exclude a vehicle prior to its dispensing episode only if such exclusion and its reason is documented; e.g. unusual facility conditions beyond the applicant's control or unusual modifications to the vehicle. All data required by the test procedure shall be taken for such vehicles for subsequent review and possible reversal of the exclusion decision made during the test. The only other reasons for excluding a vehicle from the test fleet are incomplete data or the factors in TP-201.2.
- 13.6.5 Additional vehicles may be chosen for testing at the test site by the Executive Officer. The vehicles shall be chosen, according to the Executive Officer's judgment, so that any of the first 200 vehicles, which may later be found to

have invalid data associated with them, shall have replacements from among the additional vehicles on a "first in" basis.

- 13.6.6 A matrix of fewer than 200 vehicles may be made by deleting up to a maximum of three vehicles by reducing the representation in any cell or combination of cells of the vehicle matrix, subject to the following requirements for each candidate reduced cell.
  - (a) No cell shall be reduced by more than one vehicle
  - (b) At least one dispensing episode has already been tested in each cell.
  - (c) None of the other dispensing episodes in the cell have yielded field data which, in the Executive Officer's judgment, would cause a failure to meet the standards specified in section 4.1.
  - (d) All tested dispensing episodes in all cells have yielded field data that, in the Executive Officer's judgment, would yield valid test results after subsequent review and evaluation.

#### 14. ALTERNATE TEST PROCEDURES AND INSPECTION PROCEDURES

Test procedures other than those specified in this certification procedure shall be used only if prior written approval is obtained from the Executive Officer. A test procedure is a methodology used to determine, with a high degree of accuracy, precision, and reproducibility, the value of a specified parameter. Once the test procedure is conducted, the results are compared to the applicable performance standard to determine the compliance status of the facility. Test procedures are subject to the provisions of Section 41954(h) of the H&SC.

#### 14.1 Alternate Test Procedures for Certification Testing

The Executive Officer shall approve, as required, those procedures necessary to verify the proper performance of the system.

#### 14.2 Request for Approval of Alternate Test Procedure

Any person may request approval of an alternative test procedure. The request shall include the proposed test procedure, including equipment specifications and, if appropriate, all necessary equipment for conducting the test. If training is required to properly conduct the test, the proposed training program shall be included.

#### 14.3 Response to Request

The Executive Officer shall respond within fifteen (15) days of receipt of a request for approval and indicating that a formal response will be sent within sixty (60) days. If the Executive Officer determines that an adequate evaluation cannot be completed within the allotted time, the Executive Officer shall explain the reason for the delay, and will include the increments of progress such as test protocol review and comment, testing, data review, and final determination. If the request is determined to be incomplete or unacceptable, Executive Officer shall respond with identification of any deficiencies. The Executive Officer shall issue a determination regarding the alternate procedure within sixty (60) days of receipt of an acceptable request.

#### 14.4 Testing of Alternate Test Procedures

All testing to determine the acceptability of the procedure shall be conducted by CARB staff, or by a third party responsible to and under the direction of CARB. Testing shall be conducted in accordance with the written procedures and instructions provided. The testing shall, at a minimum, consist of nine sets of data pairs, pursuant to USEPA Reference Method 301, "Field Validation of Pollutant Measurement Methods from Various Waste Media", 40 CFR Part 63, Appendix A, 57 Federal Register page 61992. Criteria established in USEPA Reference Method 301 shall be used to determine whether equivalency between the two test methods exists. Method Approval of the procedure shall be granted, on a case-by-case basis, only after all necessary testing has been conducted. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval may or may not be granted in subsequent cases without a new request for approval and additional testing to determine equivalency. If, after approval is granted, subsequent information demonstrates that equivalency between the two methods no longer meets the USEPA Method 301 requirements, the Executive Officer shall revoke the alternate status of the procedure.

#### 14.5 Documentation of Alternate Test Procedures

Any such approvals for alternate test procedures and the evaluation testing results shall be maintained in the Executive Officer's files and shall be made available upon request. Any time an alternate procedure and the reference procedure are both conducted and yield different results, the results determined by the reference procedure shall be considered the true and correct results.

#### 14.6 Inspection Procedures

Inspection procedures are methodologies that are developed to determine compliance based on applicable performance standards or specifications. Inspection procedures are typically, but not necessarily, parametric in nature and possess a built-in factor of safety, usually at least twice the applicable standard or specification. Inspection procedures are not subject to Section 41954(h) of the H&SC.

Upon submittal of an inspection procedure to CARB, the Executive Officer shall respond within thirty (30) days, providing the applicant with a determination of the applicability of Section 41960.2(d) or Section 41960.2(e) of the H&SC.

#### 15. CERTIFICATION OF SYSTEMS

The Executive Officer shall certify only those vapor recovery systems that, based on testing and engineering evaluation of that system's design, component qualities, and performance, can be expected to comply with that system's certification over the specified warranty period. With the exception of those components listed in Section 16, this certification procedure is not intended to be used to certify individual system components.

#### 15.1 One Vapor Recovery System per UST System

No more than one certified Phase II vapor recovery system may be installed on each underground storage tank (UST) system unless the Phase II systems have been specifically certified to be used in combination. For facilities with dedicated vapor piping, each underground storage tank and associated dispensing points shall be considered a UST system, and different UST systems may have different vapor recovery systems. For facilities with manifolded vapor piping connecting storage tanks, all the manifolded tanks and associated dispensing points are considered one UST system, and only one certified Phase II vapor recovery system may be installed in conjunction with that UST system.

#### 15.2 Certification Not Transferable

Upon successful completion of all the requirements, certification shall be issued to the company or individual requesting certification, as the Executive Officer deems appropriate. If the ownership, control or significant assets of the certification holder are changed as the result of a merger, acquisition or any other type of transfer, the expiration date of the certification shall remain unchanged. However, no person shall offer for sale, sell, or install any system or component covered by the certification unless the system or component is recertified under the new ownership, or, in the case of a component, is otherwise certified. Systems installed prior to the transfer shall be subject to the specifications contained in Section 19 of this procedure.

#### 16. CERTIFICATION OF NON-SYSTEM-SPECIFIC COMPONENTS

Certification of vapor recovery systems shall include certification of all components present on the system during certification testing. In order to expedite the certification process and to provide system owners and operators flexibility in the choice of components, some components may be certified as alternatives to the components certified on the system. Some components may be certified on multiple systems, provided they meet the requirements listed in this section.

#### 16.1 Properties of Non-System-Specific Components

Only those components that can be defined by performance specifications, and that do not directly affect the performance of the system, shall be considered non-system-specific components.

#### 16.2 Testing Requirements

Components that are non-system-specific shall be subjected to sufficient operational testing to verify the reliability of the component as an alternative component on a certified system. Testing on one system may be used in the evaluation of the component for use on other systems for which the performance is similar with regard to the component. For systems with dissimilar performance characteristics, additional testing may be required.

#### 16.3 Identification of Components

The tables below identify components that are system-specific, and require the full system testing, and those components that are considered to be non-system-specific. The testing requirements listed for the non-system-specific components are the minimum requirements; additional tests may be required as necessary. Any component not included in these tables shall be presumed to be system-specific unless the Executive Officer determines, in writing, that the component may be considered non-system-specific.

Table 16-1 System Specific Components

Component	
Vacuum Source	
Processor	
 Nozzle	
Control Board	

Table 16-2 Non-System Specific Components

Non-System-Specific Components	Minimum Testing Requirements
Dispenser Vapor Piping (balance)	Eng Eval., Pressure Drop, Integrity
Coaxial Hose	Eng. Eval., Operational Test, Pressure Drop, Integrity
Liquid Removal System	Eng. Eval., Operational Test, Pressure Drop, TP-201.6
Breakaway Coupling	Eng. Eval., Operational Test, Pressure Drop, Integrity
Flow Limiter	Eng. Eval., Operational Test, Function Test
Coaxial Swivel	Eng. Eval., Operational Test, Pressure Drop
Conversion Fitting	Eng. Eval., Operational Test, Pressure Drop
Pressure/Vacuum Vent Valve	Eng. Eval., Operational Test, Pressure Drop, TP-201.2B
Impact Valve (for vapor line)	Eng. Eval., Operational Test, Pressure Drop, Integrity
Phase I Delivery Elbow	Eng. Eval., Operational Test, Pressure Drop, TP-201.1
Phase I Vapor Adaptor	Eng. Eval., Operational Test, Pressure Drop, TP-201.1
Phase I Fill Adaptor	Eng. Eval., Operational Test
Phase I Drop Tube	Eng. Eval., Operational Test
Phase I Overfill Protection Device	Eng. Eval., Operational Test, TP-201.1
Phase I Fill or Vapor Cap	Eng. Eval., Operational Test, Integrity
Phase I Spill Containers	Eng. Eval., Operational Test, Integrity
Phase I Tank Bottom Protector	Eng. Eval., Operational Test
Phase I Ball Float Valve	Eng. Evaluation and Testing
Phase I Extractor Fitting	Eng. Evaluation and Testing

#### 17. DOCUMENTATION OF CERTIFICATION

Documentation of certification shall be in the form of an Executive Order listing the criteria requirements of installation and operation of a certified system.

#### 17.1 Executive Order

The certification Executive Order shall include the following items.

- 17.1.1 A list of components certified for use with the system.
- 17.1.2 Applicable Performance Standards, Performance Specifications and Test Procedures.
- 17.1.3 Applicable Operating Parameters and Limitations.
- 17.1.4 Warranty period(s).
- 17.1.5 Factory testing requirements, if applicable.

#### 17.2 Summary of Certification Process

A summary of the certification process for each certified system shall be prepared. It shall contain documentation of the successful completion of all applicable portions of the requirements contained in this Certification Procedure including but not limited to the following: All problems encountered throughout the certification process, any changes made to address the identified problems, the location of the test station(s), the types of testing performed, the frequency and/or duration of any testing or monitoring, as appropriate, and any other pertinent information about the evaluation process shall be contained in this summary.

#### 18. DURATION AND CONDITIONS OF CERTIFICATION

Vapor recovery system certifications shall specify the duration and conditions of certification.

#### 18.1 Duration of System Certification

Vapor recovery systems shall be certified for a period of four years. The certification Executive Order shall specify the date on which the certification shall expire if it is not reissued.

#### 18.2 Duration of Component Certification

Certification of a system shall include all components, and the expiration date of the certification shall apply to all system-specific components used on the system. For example, if the system is certified with nozzle A, the expiration date for nozzle A with that system will be the expiration date of the Executive Order that certifies the system.

#### 18.3 Performance Monitoring

During the certification period, any significant deficiencies identified, through periodic equipment audits, complaint investigations, certification or compliance tests, etc.,

shall be noted in the performance file and brought to the attention of the equipment manufacturer.

#### 18.4 Modification of Expiration Date

Modification of the certification for the purpose of adding system-specific components may establish a new expiration date for the system, providing the following conditions are met.

- 18.4.1 There are no significant outstanding problems that have not been resolved.
- 18.4.2 The system was subjected to, and passed, the operational and efficiency testing required for a new system.
- 18.4.3 The expiration date for system-specific components that were not tested is not changed.
- 18.4.4 For example, the system that was certified with nozzle A is tested with nozzle B. The system with nozzle A can be referred to as sub-system A, and the system with nozzle B can be referred to as sub-system B. Upon successful completion of all the required testing, sub-system B may be certified for a period of time not to exceed four years, and the expiration date will be established. This will not, however, change the expiration date for sub-system A. The Table below indicates the appropriate CARB actions with regard to certifications that are expiring.

Table 18-1
CARB Actions Regarding Expiring Certifications

Case	Recertification Requested?	Unresolved Problems?	Time Until Expiration	CARB Action
1	Yes	No	1 year	Letter of Intent to Recertify
	Yes	No	6 months	Draft EO for Review
	Yes	No	4 months	Revised Draft EO for Review
	Yes	No	1 month	Issue EO
2	No	Yes	1 year	Notification of Impending Expiration
	No	Yes	Expired	Notification of Expiration
3 .	Yes	Yes	Anytime	Notify Certification Holder
	Yes	Yes	1 year	Notification of Impending Expiration (except if Case 3a)
3a	Yes	Yes	1 year	Resolution Likely, Time Insufficient Extend Certification for 1 year max

#### 19. CERTIFICATIONS THAT HAVE BEEN TERMINATED

This section applies only to systems for which the certification was terminated but that are allowed to remain in use pursuant to section 41956.1 of the Health and Safety Code. Systems that were installed as of the effective date of the adoption of a new standard, or that are otherwise subject to 41956.1, may remain in use for the remainder of the useful life or four years, whichever is shorter, provided they comply with all of the specifications of this Section. This shall include all components and parts of the system, subject to the following requirements.

#### 19.1 Replacement of Components or Parts

- 19.1.1 Components and replacement parts meeting the most current performance standards or specifications may be certified for use with the no-longercertified system for the remainder of the allowable in-use period of the system.
- 19.1.2 A component or replacement part not meeting the most current performance standards or specifications, but which was certified for use with the system prior to the termination of the certification, shall be used as a replacement only if no compatible component or part that meets the new standards or specifications has been certified as a replacement and are commercially available. The certification of the component or part shall terminate at the end of the allowable in-use period for the system unless otherwise specified in the certification of the replacement component or part.
- 19.1.3 A component or part that was not certified for use with the system prior to the termination of certification, and that does not meet all of the most current standards or specifications, may be certified as a replacement part or component for use on the system provided that there are no other commercially available certified parts meeting the most current performance standards or specifications.
- 19.1.4 When a certified, compatible component or replacement part that meets the new standards becomes commercially available, only that component or part shall be installed. This shall not require the replacement of already-installed equipment prior to the end of the useful life of that part or component. Components or parts installed at the time the system reaches the end of the allowable in-use period for the system, may no longer be used even if the end of their useful life has not been reached.
- 19.1.5 Non-unihose configuration dispensers installed before April 1, 2003, may remain in use for the remainder of the useful life and may be replaced with non-unihose configuration dispensers as prescribed in section 4.11.

# California Environmental Protection Agency

# Air Resources Board

**Vapor Recovery Compliance Test Procedure** 

PROPOSED: TP-201.1B

Static Torque of Rotatable Phase I Adaptors

Adopted:\_\_\_\_

Note: All text is proposed for adoption. As authorized by title 2, California Code of Regulations, section 8, the use of underlines to indicate addition or adoption is omitted.

# California Environmental Protection Agency Air Resources Board

#### **Vapor Recovery Test Procedure**

#### TP-201.1B

#### Static Torque of Rotatable Phase I Adaptors

Definitions common to all certification and test procedures are in:

#### **D-200 Definitions for Vapor Recovery Procedures**

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

#### 1. PURPOSE AND APPLICABILITY

1.1 The purpose of this procedure is to quantify the amount of static torque required to start the rotation of a rotatable Phase I adaptor. This procedure determines compliance with the performance specification required by CARB.

#### 2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

2.1 A compatible dust cap is installed on a rotatable Phase I adaptor. A Torque Test Tool is then installed on the dust cap and three static torque measurements are taken. If the resulting, average static torque is less than, or equal to, the maximum allowable static torque value specified in Certification Procedure CP-201, the adaptor is verified to be in compliance.

#### 3. BIASES AND INTERFERENCES

- 3.1 Missing or defective gaskets in the dust cap may bias the results towards compliance as a dust cap may slip on the rotatable adaptor prior to the adaptor rotating. This bias is eliminated by ensuring that the dust cap seal is securely in place and does not show signs of excessive wear or damage.
- 3.2 Gasoline or other lubricants on the sealing surface of the rotatable adaptor or the dust cap seal can cause the dust cap to slip and may bias the results towards compliance. This bias is eliminated by ensuring that the sealing surface of the rotatable adaptor and dust cap is clean, dry and free of lubricants.

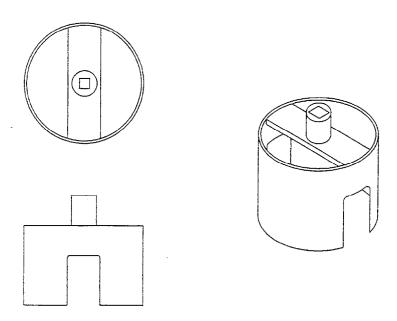
#### 4. SENSITIVITY, RANGE, AND PRECISION

**4.1** The measurable static torque is dependent upon the range of the Torque Wrench used for the test. The recommended Torque Wrench range specified in Section 5.1 provides sufficient precision at the maximum allowable static torque.

#### 5. EQUIPMENT

- 5.1 Torque Wrench. Use a compatible Torque Wrench to measure the static torque of the rotatable vapor recovery adaptor.
  - 5.1.1 The minimum full-scale range of the Torque Wrench shall be 144 inch-pounds (12 foot-pounds) with minimum accuracy of 1.0 percent.
- 5.2 Static Torque Test Assembly. Use a compatible dust cap and rotatable adaptor Torque Test Tool, Phil-Tite<sup>®</sup> Part Number 6004 or equivalent. A depiction of the Phil-Tite<sup>®</sup> Torque Test Tool is shown in Figure 1. An example of a complete Static Torque Test Assembly is shown in Figure 2.

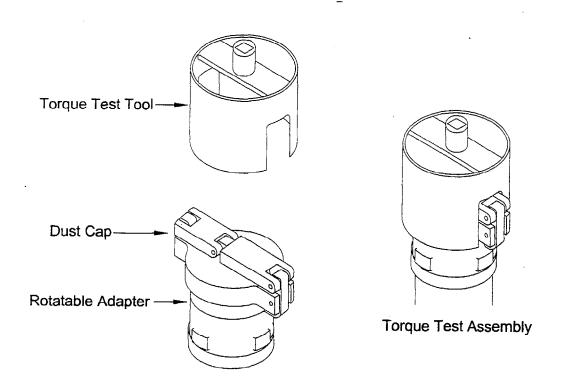
Figure 1
Phil-Tite® Torque Test Tool



5.3 Traffic Cones. Use traffic cones to encircle the Phase I area while the test is being conducted.

5.4 Socket Extension. If required to conduct testing, use a compatible socket extension that does not exceed 12 inches in length.

Figure 2
Static Torque Test Assembly



#### 6. PRE-TEST PROCEDURES

- 6.1 Place the traffic cones around the perimeter of the Phase I spill containment buckets, allowing sufficient space to safely conduct the test.
- 6.2 Remove the lids of the Phase I spill containment buckets. Visually determine that the adaptors are of the rotatable design.
- 6.3 Inspect the dust caps to ensure that the caps and that the gaskets are intact and do not show signs of excessive wear or damage.
- 6.4 Inspect the rotatable adaptors. If the adaptors are wet or covered with a lubricant, wipe the adaptors clean to ensure maximum friction between the dust cap and the adaptor seal surface.

#### 7. TEST PROCEDURE

- 7.1 Install the dust cap on the Phase I rotatable adaptor.
- 7.2 Install the Torque Test Tool on the dust cap as shown in Figure 2.
- 7.2 Install the Torque Wrench into the Torque Test Tool. If the spill containment bucket is too deep to allow connection of the Torque Wrench, use a compatible socket extension to reach into the bucket to the Torque Test Tool. The socket extension shall not exceed 12 inches in length.
- 7.3 Place one hand on top of the Torque Wrench, directly above the center of the Torque Test Tool to keep the wrench level when applying pressure. Gently apply an even, steady pressure to the Torque Wrench while observing the adaptor for rotation. Once the adaptor begins to rotate, record the measured static torque on the data sheet.
- 7.4 Repeat section 7.3 two additional times for each adaptor tested.

#### 8. POST-TEST PROCEDURES

- **8.1** Remove the Torque Test Assembly and replace the appropriate lids on each of the spill containment buckets.
- 8.2 Remove the traffic cones from the Phase I area.

#### 9. CALCULATING RESULTS

**9.1** Calculate the arithmetic average of the three tests for each adapter tested and record on a data sheet.

#### 10. REPORTING RESULTS

10.1 Report the gasoline dispensing facility name, adaptor type, manufacturer, model and grade of gasoline and static torque measurements on a data sheet as shown on Form 1.

#### 11. ALTERNATE PROCEDURES

11.1 This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the CARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

# Form 1 Static Torque of Rotatable Phase I Adaptors

Test Company:		Conducted By:	
Test Date:	· · · · · · · · · · · · · · · · · · ·	Facility Name:	
Facility Address:		City: -	
Measurement Un	its: (circle one): inch-	pounds foot-po	ounds
Vapor Adaptor 1	Vapor Adaptor 2	Vapor Adaptor 3	Vapor Adaptor 4
Brand:	Brand:	Brand:	Brand:
Model:	Model:	Model:	Model:
Grade:	Grade:	Grade:	Grade:
Torque 1:	Torque 1:	Torque 1:	Torque 1:
Torque 2:	Torque 2:	Torque 2:	Torque 2:
Torque 3:	Torque 3:	Torque 3:	Torque 3:
verage: Average:		Average:	Average:
			·
Product Adaptor 1	Product Adaptor 2	Product Adaptor:	Product Adaptor 4
Brand:	Brand:	Brand:	Brand:
Model:	Model:	Model:	Model:
Grade:	Grade:	Grade:	Grade:
Torque 1:	Torque 1:	Torque 1:	Torque 1:
Torque 2:	Torque 2:	Torque 2:	Torque 2:
Torque 3:	Torque 3:	Torque 3:	Torque 3:
	Average:	Average:	Average:

### California Environmental Protection Agency

# Air Resources Board

**Vapor Recovery Compliance Test Procedure** 

PROPOSED TP-201.1C

Pressure Integrity of Drop Tube/Drain Valve Assembly

Adopted:\_\_\_\_

Note: All text is proposed for adoption. As authorized title 2, California Code of Regulations, section 8, underline to indicate addition or adoption of the regulations is omitted.

# California Environmental Protection Agency Air Resources Board

#### Vapor Recovery Test Procedure

#### TP-201.1C

#### Pressure Integrity Of Drop Tube/Drain Valve Assembly

Definitions common to all certification and test procedures are in:

#### D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

#### 1. PURPOSE AND APPLICABILITY

1.1 The purpose of this procedure is to quantify the pressure integrity of both a drop tube and drain valve seal when a drop tube is installed below a spill containment bucket on a two-point Phase I system. This procedure is used during certification and to determine compliance of equipment at installed at gasoline dispensing facilities with the performance specification for the maximum allowable leakrate as defined in the Certification Procedure CP-201.

#### 2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

- 2.1 A compatible product cap is modified to allow the introduction of nitrogen into a Phase I drop tube. A pressure-measuring device is connected to the modified cap. If the resulting measured nitrogen flowrate necessary to maintain a steady-state pressure of 2.00 inches H<sub>2</sub>O is less than, or equal to, the maximum allowable leakrate the Drop Tube/Drain Valve Assembly is verified to be in compliance.
- 2.2 If the introduction of nitrogen, at a flowrate equal to the maximum allowable leakrate does not result in a steady state pressure that meets, or exceeds, the limits specified in CP-201, the Phase I product adaptor shall be inspected and tested. Any leaks attributable to the Phase I product adaptor shall be corrected and the test repeated to ensure the measured pressure versus flowrate is attributable only to the Drop Tube/Drain Valve Assembly.

#### 3. BIASES AND INTERFERENCES

3.1 Missing or defective gaskets on the Phase I product adaptor, or a loose adaptor, may bias the results towards noncompliance. This bias is eliminated by testing the Phase I product adaptor for leaks prior to final determination of the compliance status of the Drop Tube/Drain Valve Assembly.

- 3.2 Refueling during the test may bias the results. No vehicle refueling or bulk deliveries to any of the tanks at the facility shall occur during this test.
- **3.3** Product levels less than four (4) inches above the highest opening at the bottom of the submerged drop tube may bias the test toward noncompliance.
- 3.4 Leaks in the test equipment will bias the results toward noncompliance. Prior to conducting the test, this bias is eliminated by conducting a leak check of the test equipment leak detection solution may also be used during the test\_to verify the absence of leaks in the test equipment.

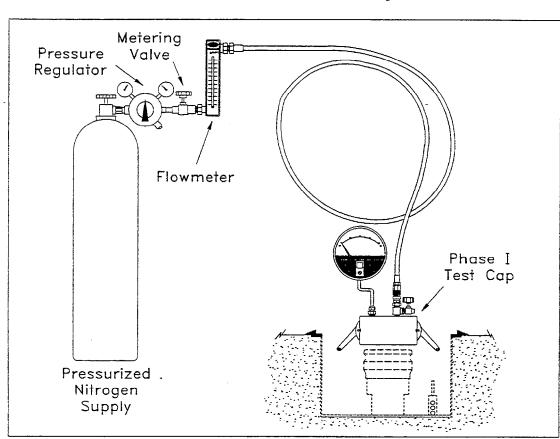
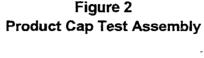


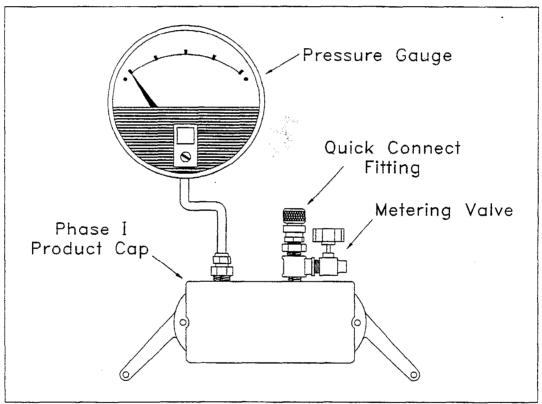
Figure 1
Pressure Introduction Assembly

3.5 Use of this procedure to quantify the leak rate of containment box drain valves that drain liquid into the ullage of the storage tank, rather than into the drop tube, will yield invalid results.

#### 4. SENSITIVITY, RANGE, AND PRECISION

- 4.1 The measurable leakrate is dependent upon the range of the flowmeter used for the test. The recommended flowmeter range specified in Section 5.1 provides sufficient precision at the maximum allowable leakrate defined in CP-201.
- **4.2** The sensitivity of the pressure measuring device is 0.01 inches H<sub>2</sub>O for electronic pressure measuring devices and 0.05 inches H<sub>2</sub>O for mechanical pressure gauges.





#### 5. EQUIPMENT

5.1 Pressure Introduction Assembly. Use a product cap compatible with the Phase I product adaptor. The cap shall be equipped with a pressure tap and flowmeter capable of measuring flowrates equal to the maximum allowable leakrate. The maximum allowable full-scale range for the flowmeter shall be 1.00 CFH. The flowmeter shall be calibrated for use with nitrogen. As a safety precaution, the hose used to feed nitrogen into the assembly shall be steel braided, or a separate grounding strap may be used. An example of a complete Pressure Introduction Assembly is shown in Figure 1. An example of a Product Cap Test Assembly is shown in Figure 2.

- **5.2** Pressure Measuring Device. Use a pressure-measuring device to monitor the pressure in the drop tube.
  - 5.2.1 If an electronic pressure-measuring device is used, the maximum full scale range of the device shall be 10 inches  $H_2O$ . The minimum accuracy shall be 0.5 percent and the pressure measuring device shall be readable to the nearest 0.01 inches  $H_2O$ .
  - 5.2.2 If a mechanical pressure-measuring device is used, the maximum fullscale range shall be 5 inches H<sub>2</sub>O. The minimum accuracy shall be 1.0 percent and the minimum graduations shall be 0.05 inches H<sub>2</sub>O. The minimum diameter of the pressure gauge face shall be 4 inches.

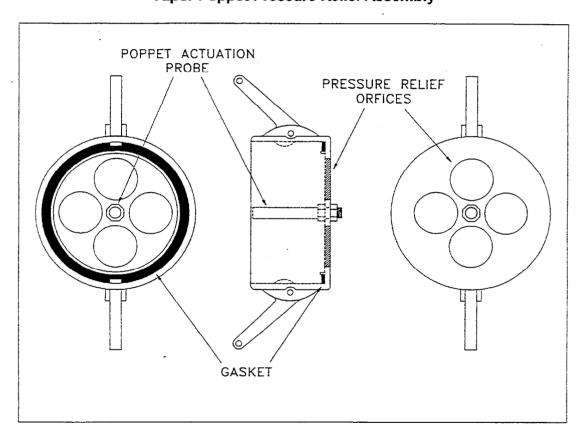


Figure 3
Vapor Poppet Pressure Relief Assembly

- **5.3** Nitrogen. Use commercial grade gaseous nitrogen in a high-pressure cylinder, equipped with a two-stage pressure regulator and a one psig pressure relief valve.
- **5.4** Stopwatch. Use a stopwatch accurate to within 0.2 seconds to time the duration of the test.
- **5.5** Leak Detection Solution. Any commercial liquid solution designed to detect vapor leaks may be used to verify the pressure integrity of the Phase I product adaptor during this test.

- 5.6 Vapor Poppet Pressure Relief Assembly. Use an assembly to open the Phase I vapor poppet during testing. This will ensure that the underground storage tank (UST) ullage and liquid surface is at zero gauge pressure. An example of a Vapor Poppet Pressure Relief Assembly is shown in Figure 3.
- 5.7 Traffic Cones. Use traffic cones to encircle the area containing the Phase I spill containment buckets while the test is being conducted.
- 5.8 Tank Gauging Stick. Use a tank gauging stick of sufficient length to verify that the UST liquid level is at least four (4) inches above the highest opening at the bottom of the submerged drop tube. The tank gauging stick shall be equipped with a non-sparking "L" bracket at the end.

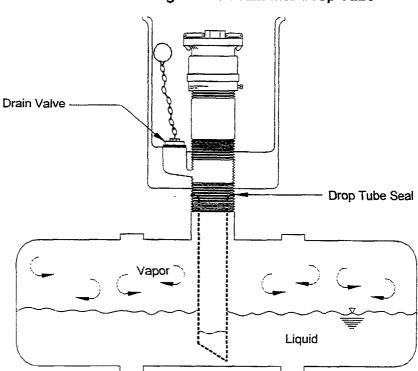


Figure 3

Drain Valve Configured to Drain into Drop Tube

#### 6. PRE-TEST PROCEDURES

6.1 The flowmeter and pressure-measuring device shall be calibrated within the 180 days prior to conducting the test. The flowmeter(s) shall be calibrated for use with nitrogen. Calibrations shall be conducted in accordance with EPA or CARB protocols. CARB calibration methodology for flow meters are contained in Appendix D of Air Monitoring Quality Assurance, Volume VI, Standard Operating Procedures for Stationary Source Emission Monitoring and Testing, January 1979.

- **6.2** Place the traffic cones around the perimeter of the Phase I spill containment buckets, allowing sufficient space to safely conduct the test.
- 6.3 Remove the lids of the Phase I spill containment buckets. Visually determine that the drop tube is installed below the spill containment bucket and that the drain path allows liquid to drain directly into the drop tube.
- 6.4 Inspect the Phase I product adaptor to ensure that the gasket is intact and that the adaptor is securely attached to the Phase I product stem.
- **6.5** Verify that the liquid level in the storage tank is at least four (4) inches above the highest opening at the bottom of the submerged drop tube using the tank gauging stick.
- 6.6 Inspect the drain valve configuration. Verify that the drain valve drains liquid directly into the drop tube above the Overfill Prevention device, as shown in Figure 4, rather than into the underground storage tank ullage space. If the drain valve drains into the underground tank ullage space, this procedure will only quantify the leak rate through the connections.

#### 7. TEST PROCEDURE

- 7.1 Connect the Pressure Introduction Assembly to the Phase I product drop tube as shown in Figure 1. Connect the nitrogen supply line to the inlet of the flowmeter.
- 7.2 Connect the Vapor Poppet Pressure Relief Assembly to the Phase I vapor poppet to bring the UST headspace to atmospheric pressure.
- 7.3 With no vehicle refueling occurring, open the nitrogen supply and adjust the nitrogen flowrate to at least three times the maximum allowable leakrate specified in CP-201, and start the stopwatch.
- 7.4 Wait until the pressure measuring device records a pressure between 2.00 and 2.20 inches H<sub>2</sub>O.
  - 7.4.1 If the pressure does not reach at least 2.00 inches H<sub>2</sub>O within 90 seconds, the Drop Tube/Drain Valve Assembly does not comply with the maximum allowable leakrate.
  - 7.4.2 If the pressure reaches at least 2.00 inches H<sub>2</sub>O, reduce the introduction of nitrogen to the allowable leakrate specified in CP-201. Wait until the pressure reaches steady state conditions for at least ten (10) seconds and record both the nitrogen flowrate and the steady state pressure. If the steady state pressure is less than 2.00 inches H<sub>2</sub>O, the Drop Tube/Drain Valve Assembly does not comply with the maximum allowable leakrate.
  - 7.4.3 If the Drop Tube/Drain Valve Assembly does not reach the minimum specified pressure, use a soap solution on the rotatable adaptor to check for leaks at the rotation mechanism or the adaptor seal.

#### 8. POST-TEST PROCEDURES

- **8.1** Remove the Pressure Introduction Assembly and the Vapor Poppet Pressure Relief Assembly from the Phase I connections. Replace the caps on the appropriate Phase I adaptors, and the lids on the appropriate spill containment buckets.
- **8.2** Remove the traffic cones from the Phase I area.
- 8.3 If the steady-state pressure, at a nitrogen flowrate rate equal to the allowable leakrate, was not equal to or greater than 2.00 inches H<sub>2</sub>O, Equation 9-1 may be used to determine the leakrate at 2.00 inches H<sub>2</sub>O.

#### 9. CALCULATING RESULTS

9.1 If the flowrate of Nitrogen was at the upper limit of the flowmeter and the measured pressure never reached 2.00 inches H<sub>2</sub>0, but was greater than 0.0 inches H<sub>2</sub>O, the actual leakrate at a pressure of 2.00 inches H<sub>2</sub>O shall be calculated as follows:

$$Q_{2.00} = (2.00)^{1/2} \left[ \frac{Q_{actual}}{(P_{actual})^{1/2}} \right]$$
 Equation 9 – 1

Where:

 $Q_{2.00}$  = The leakrate of the drop tube assembly at 2.00 inches  $H_2O$ , cubic feet per hour

 $Q_{actual}$  = The actual introduction rate of nitrogen, cubic feet per hour

P<sub>actual</sub> = The actual measured steady-state pressure at Q<sub>actual</sub>, inches H<sub>2</sub>O

2.00 = Pressure, inches  $H_2O$ 

#### 10. REPORTING RESULTS

**10.1** Report the results of the quantification of the leakrate through the Drop Tube/Drain Valve Assembly as shown on Form 1.

#### 11. ALTERNATE PROCEDURES

11.1 This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the CARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

#### Form 1

#### Field Data Sheet

#### Pressure Integrity Of Drop Tube/Drain Valve Assembly

acility: Test D			st Date:		Tester(s):			
Address:				City:		Zip Code:		
Phase I System Type:				Phase II System Type:				
Date of Last Flowmeter Calibration:				Date	of Last Pressure Device (	Calibration:		
			Test Re	esults	3			
Nitrogen Flowrate (CFH)	Pressure (inches H <sub>2</sub> 0)	- Make/N	lodel Sp	ill :ket	∴Make/Model Rotatable Product Adapter	Make/Model-Rotatable		
						·		
		·						
s:								
·								
					<del></del>			
	Nitrogen Flowrate (CFH)	Nitrogen Flowrate (CFH) (inches H <sub>2</sub> 0)	Nitrogen Flowrate (CFH) (inches H <sub>2</sub> 0). Containr	Test Re Nitrogen Flowrate Pressure (CFH) (inches H <sub>2</sub> 0) Containment Bud	City: stern Type: It Flowmeter Calibration:  Test Results  Nitrogen Flowrate Pressure Make/Model-Spill (GFH) (inches H <sub>2</sub> 0) Containment Bucket	stem Type:  It Flowmeter Calibration:  Test Results  Nitrogen Flowrate (CFH)  (CFH)  Test Results  Make/Model Spill (Containment Bucket Product Adapter)		

### California Environmental Protection Agency

# Air Resources Board

**Vapor Recovery Test Procedure** 

PROPOSED TP-201.20 201.1D

Pressure Integrity of Drop Tube Overfill Protection Devices

Adopted: February 1, 2001 Amended:

Note: The text is shown in strikeout to indicate text that is proposed for deletion and <u>underline</u> to indicate text that is proposed for addition.

### California Environmental Protection Agency Air Resources Board

#### Vapor Recovery Test Procedure

TP-201.<del>20</del>1D

#### Pressure Integrity of Drop Tube Overfill Protection Devices

Definitions common to all certification and test procedures are in:

#### D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "CARB" refers to the State of California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

#### 1. PURPOSE AND APPLICABILITY

1.1 The purpose of this procedure is to quantify the pressure integrity of overfill protection devices located in the Phase I product drop tube on two-point Phase I systems. It is also used to quantify the pressure integrity of containment box drain valves when the drain valve is installed so as to drain into the drop tube. This procedure It is applicable only to those Gasoline Dispensing Facilities (GDF) equipped with an overfill protection device located in the Phase I product drop tube. This procedure It is used during certification and to determines compliance of devices at installed gasoline dispensing facilities with the performance standard specification for the maximum allowable leakrate as defined in the Certification Procedure (CP-201).

#### 2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

- 2.1 A compatible product cap is modified to allow the introduction of nitrogen into the Phase I drop tube. A pressure-measuring device is connected to the modified cap. If the resulting measured nitrogen flowrate necessary to maintain a steady-state pressure of 2.00 inches H<sub>2</sub>O is less than, or equal to, the maximum allowable leakrate the overfill protection device is verified to be in compliance.
- 2.2 If the introduction of nitrogen, at a flowrate equal to the maximum allowable leakrate, does not result in a steady state pressure that meets, or exceeds, the value specified in CP-201, the Phase I product adaptor is inspected and tested. Any leaks attributable to the Phase I product adaptor are corrected and the test is repeated to ensure the measured pressure versus flowrate is attributable only to the overfill protection device or, if applicable, the containment box drain valve.

#### 3. BIASES AND INTERFERENCES

- 3.1 Missing or defective gaskets on the Phase I product adaptor, or a loose adaptor, may bias the results towards noncompliance. This bias is eliminated by testing the Phase I product adaptor for leaks prior to final determination of the compliance status of the overfill protection device.
- 3.2 Vehicle refueling during the test may bias the results. No vehicle refueling or bulk deliveries to any of the tanks at the facility shall occur during this test.
- 3.3 Product levels less than four (4) inches above the highest opening at the bottom of the submerged drop tube may bias the test toward noncompliance.
- 3.4 Liquid levels in the drop tube that are above the location of the overfill protection device will bias the results toward compliance. Ensure that the liquid level is below the overfill protection device.
- 3.5 Leaks in the test equipment will bias the results toward noncompliance. Prior to conducting the test, this bias is eliminated by conducting a leak check of the test equipment. During the test, this bias is eliminated by using ILeak detection solution may also be used during the test to verify the absence of leaks in the test equipment.
- 3.6 Use of this procedure to quantify the leak rate of containment box drain valves that drain liquid into the ullage of the storage tank, rather than into the drop tube, will yield invalid results.

#### 4. SENSITIVITY, RANGE, AND PRECISION

- 4.1 The measurable leakrates are dependent upon the range of the flowmeter used for the test. The recommended flowmeter range specified in Section 5.1 provides sufficient precision at the maximum allowable leakrate defined in CP-201.
- 4.2 The sensitivity of the pressure measuring device is 0.01 inches  $H_2O$  for electronic pressure measuring devices and 0.05 inches  $H_2O$  for mechanical pressure gauges.

#### 5. EQUIPMENT

5.1 Drop Tube Pressure Integrity Assembly. Use a product cap compatible with the Phase I product adaptor. The cap shall be equipped with a pressure tap and a flowmeter capable of measuring flowrates equal to the maximum allowable leakrate specified in CP-201 and three times the maximum allowable leakrate. The maximum allowable full-scale range for the flowmeter shall be 1.0 CFH. The flowmeter shall be calibrated for use with nitrogen. An example of a complete Drop Tube Pressure Integrity Assembly is shown in Figure 1. An example of a Product Cap Test Assembly is shown in Figure 2.

- **5.2** Pressure Measuring Device. Use a pressure-measuring device to monitor the pressure in the drop tube.
  - 5.2.1 If an electronic pressure-measuring device is used, the maximum fullscale range of the device shall be 10 inches H<sub>2</sub>O. The minimum accuracy shall be 0.5 percent and the pressure measuring device shall be readable to the nearest 0.01 inches H<sub>2</sub>O.
  - 5.2.2 If a mechanical pressure-measuring device is used, the maximum fullscale range shall be 5 inches H<sub>2</sub>O. The minimum accuracy shall be 1.0 percent and the minimum graduations shall be 0.05 inches H<sub>2</sub>O. The minimum diameter of the pressure gauge face shall be 4 inches.

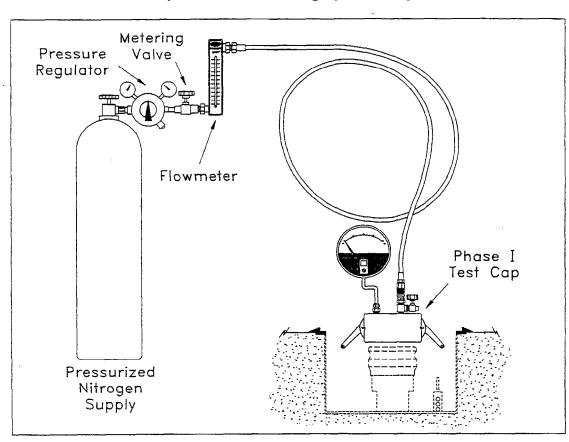


Figure 1
Drop Tube Pressure Integrity Assembly

- 5.3 Nitrogen. Use commercial grade gaseous nitrogen in a high-pressure cylinder, equipped with a two-stage pressure regulator and a one psig pressure relief valve.
- **5.4** Stopwatch. Use a stopwatch accurate to within 0.2 seconds to time the duration of the test.

- 5.5 Leak Detection Solution. Any commercial liquid solution designed to detect vapor leaks may be used to verify the pressure integrity of the Phase I product adaptor during this test.
- 5.6 Vapor Poppet Pressure Relief Assembly. Use an assembly to open the Phase I vapor poppet during the test. This will ensure that the pressure on the underground storage tank (UST) side of the overfill protection device is at zero gauge. An example of a Vapor Poppet Pressure Relief Assembly is shown in Eigure 3.
- 5.7 Inflatable Plumber' Bladder. Use a "3-4" inch diameter inflatable plumber's bladder and extension hose equipped with a safety chain, as shown in Figure 4, to isolate the drain valve from the Overfill Prevention Device when applicable. The safety ring must be removable, allowing the tester to remove the ring following inflation and attach the ring prior to deflation
- **5.7**-**5.8** Traffic Cones. Use traffic cones to encircle the area containing the Phase I manholes while the test is being conducted.
- 5.8-5.9 Tank Gauging Stick. Use a tank gauging stick of sufficient length to verify that the UST liquid level is at least four (4) inches above the highest opening at the bottom of the submerged drop tube. The tank gauging stick shall be equipped with a non-sparking "L" bracket at the end.

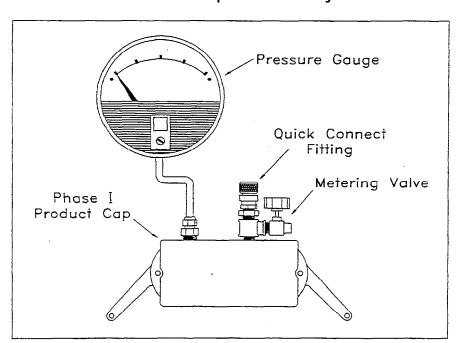


Figure 2
Product Cap Test Assembly

#### 6. PRE-TEST PROCEDURES

- 6.1 The flowmeter and pressure-measuring device shall be calibrated within the 180 days prior to conducting the test. The flowmeter(s) shall be calibrated for use with nitrogen. Calibrations shall be conducted in accordance with EPA or CARB protocols. CARB calibration methodology for flowmeters are contained in Appendix D of Air Monitoring Quality Assurance, Volume VI, Standard Operating Procedures for Stationary Source Emission Monitoring and Testing, January 1979.
- 6.2 Place the traffic cones around the perimeter of the Phase I containment boxes, allowing sufficient space to safely conduct the test.
- **6.3** Remove the lids of the Phase I containment boxes. Visually determine that the drop tube is equipped with an overfill protection device. If the drop tube is not equipped with an overfill protection device, and the drain valve does not drain into the drop tube, the test will only quantify leaks that occur at the Phase I adaptor.
- 6.4 Inspect the Phase I product adaptor to ensure that the gasket is intact and that the adaptor is securely attached to the Phase I product stem.
- 6.5 Verify that the liquid level in the storage tank is at least four (4) inches above the highest opening at the bottom of the submerged drop tube. This may be accomplished by using a the tank gauging stick equipped with a non-sparking "L" bracket on the end.

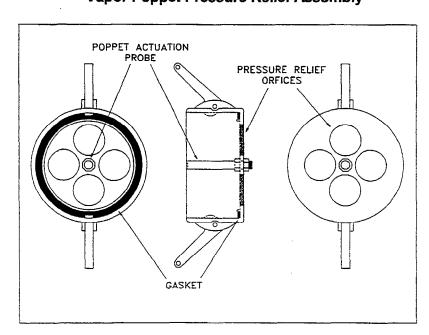
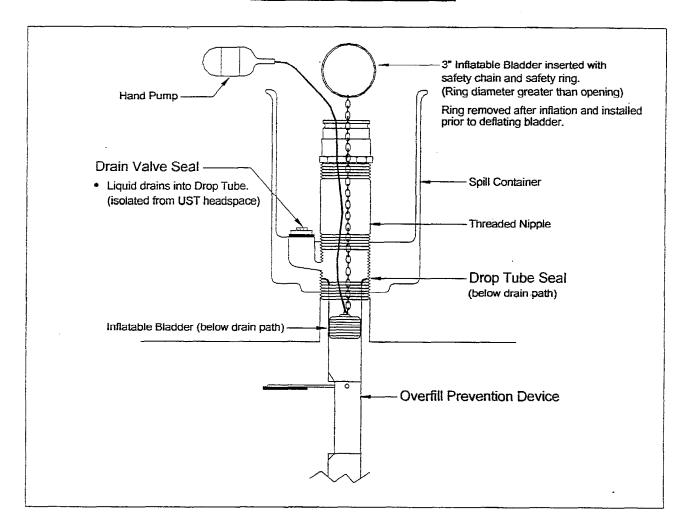


Figure 3
Vapor Poppet Pressure Relief Assembly

directly into the drain valve configuration. Determine whether the drain valve drains liquid directly into the drop tube above the Overfill Prevention device, as shown in Figure 4, rather than into the underground storage tank ullage space. If the drain valve drains into the drop tube, the procedure will quantify the leak rate through both the Overfill Prevention Device and the drain valve, and the maximum allowable leak rate for both devices is the sum of the two individual leak rates.

Figure 4 Inflatable Bladder Installation



#### 7. TEST PROCEDURE

- 7.1 Connect the Drop Tube Pressure Integrity Assembly to the Phase I product drop tube as shown in Figure 1. Connect the nitrogen supply line to the inlet of the flowmeter.
- 7.2 Connect the Vapor Poppet Pressure Relief Assembly to the Phase I vapor poppet to bring the UST headspace to atmospheric pressure.
- 7.3 With no vehicle refueling occurring, open the nitrogen supply and adjust the nitrogen flowrate to at least three times the maximum allowable leakrate specified in CP-201, and start the stopwatch. Use leak detection solution on the Drop Tube Pressure Integrity Assembly and verify that the test equipment does not leak at any of the connections.
- 7.4 Wait until the pressure measuring device records a pressure between 2.00 and 2.20 inches H<sub>2</sub>O.
  - 7.4.1 If the pressure does not reach at least 2.00 inches H<sub>2</sub>O within <del>90</del>-180 seconds, the Drop Tube assembly does not comply with the maximum allowable leakrate.
  - 7.4.2 If the pressure reaches at least 2.00 inches H<sub>2</sub>O, reduce the introduction of nitrogen to the allowable leakrate specified in CP-201. Wait until the pressure reaches steady state conditions for at least ten (10) thirty (30) seconds and record both the nitrogen flowrate and the steady state pressure. If the steady state pressure is less than 2.00 inches H<sub>2</sub>O, the Drop Tube assembly does not comply with the maximum allowable leakrate.
- 7.5 Determine the leak rate through the drain valve alone, if applicable. This step may be used if the assembly did not meet the maximum allowable leak rate and to verify if the leak is attributed to the drain valve or the overfill protection device.
  - 7.5.1 Remove the Product Test Cap from the product adaptor.
  - 7.5.2 Carefully install an inflatable plumber's bladder ("3 4" inch model) into the drop tube as shown in Figure 4 and inflate. Once inflated, carefully remove the safety ring allowing the chain to rest on top of the bladder and reinstall the Product Test Cap. The drain valve is now isolated from the overfill protection device.
  - 7.5.3 Conduct the procedure pursuant to sections 7.1 through 7.4.
  - 7.5.4 Care must be taken to ensure that the safety ring is installed prior to deflating the bladder to avoid the bladder from falling down into the drop tube.

#### 8. POST-TEST PROCEDURES

8.1 Carefully remove the Drop Tube Pressure Integrity Assembly and the Vapor Poppet Pressure Relief Assembly from the Phase I connections.—Replace the caps on the appropriate Phase I adaptors, and the appropriate lids on the containment boxes.

- 8.2 Reinstall the safety ring and deflate the inflatable plumbers bladder.
- 8.3 Replace the caps on the appropriate Phase I adaptors, and the appropriate lids on the containment boxes.
- 8.2 8.4 Remove the traffic cones from the Phase I area.
- 8.3 8.5 If the steady-state pressure, at a nitrogen introduction rate equal to the allowable leakrate, was not equal to 2.00 inches H<sub>2</sub>O, use Equation 9-1 to determine the leakrate at 2.00 inches H<sub>2</sub>O.

#### 9. CALCULATING RESULTS

9.1 If the flowrate of Nitrogen was at the upper limit of the flowmeter and the measured pressure never reached 2.00 inches H<sub>2</sub>0, but was greater than 0.0 inches H<sub>2</sub>O, the actual leakrate at a pressure of 2.00 inches H<sub>2</sub>O shall be calculated as follows:

$$Q_{2.00} = (2.00)^{1/2} \left[ \frac{Q_{actual}}{(P_{actual})^{1/2}} \right]$$

Equation 9-1

Where:

Q<sub>2.00</sub> = The leakrate of the drop tube assembly at 2.00 inches H<sub>2</sub>O, cubic feet per hour

 $Q_{actual}$  = The actual introduction rate of nitrogen, cubic feet per hour

P<sub>actual</sub> = The actual measured steady-state pressure at Q<sub>actual</sub>, inches H<sub>2</sub>O

2.00 = Pressure, inches H<sub>2</sub>O

#### 10. REPORTING RESULTS

**10.1** Report the results of the quantification of the leakrate through the drop tube overfill protection assembly as shown in Form 1.

#### 11. ALTERNATE PROCEDURES

11.1 This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the ARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

# Form 1 Field Data Sheet Drop Tube Overfill Protection

Facility: Test Date:			Test Date:	Tester(s):					
Address:				(	City: Zipcode:				
Make & Model of Overfill Protection:						Phase	e II System Type:		
Date of Last Flowmeter Calibration:				]	Date of	Last F	Pressure Device Ca	alibration:	
	Test Results								
Product Grade	N₂ Flowrate (Overfill Only) (CFH)	Pressure (in. H <sub>2</sub> O)	(0	N <sub>2</sub> Flowrate Overfill + Drain Valve) (CFH)	Pres (in.	sure H₂O)	N <sub>2</sub> Flowrate (Drain Valve Only) (CFH)	Pressure (in. H <sub>2</sub> O)	Difference (Overfill Leakrate) (CFH)
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## California Environmental Protection Agency

## Air Resources Board

#### **Vapor Recovery Test Procedures**

TP - 201.4

### DETERMINATION OF DYNAMIC PRESSURE PERFORMANCE OF VAPOR RECOVERY SYSTEMS OF DISPENSING FACILITIES

Adopted: April 12, 1996 Amended: April 28, 2000

Note: This procedure is being amended. For ease of viewing, the method is shown as repealed text.

Repealed TP-201.4

## California Environmental Protection Agency Air Resources Board

**Vapor Recovery Test Procedure** 

TP-201.4

Determination of Dynamic Pressure Performance of Vapor Recovery Systems of Dispensing Facilities

#### 1 APPLICABILITY

Definitions common to all certification and test procedures are in:

#### D-200 Definitions for Certification Procedures and Test Procedures for Vapor Recovery Systems

For the purpose of this procedure, the term "ARB" refers to the State of California Air Resources Board, and the term "ARB Executive Officer" refers to the Executive Officer of the ARB or his or her authorized representative or designate.

This test procedure can be used to quantify the dynamic pressure (back-pressure) in the vapor path leading from the dispensing nozzle to the storage tank. The dynamic pressure associated with vehicle fueling is determined by various alternative procedures, one of which is applied as appropriate for the operational characteristics of the subject vapor recovery system.

This test procedure is used to determine the pressure performance standard of a vapor recovery system during the certification process and subsequently to determine compliance with that performance standard for any installations of such a system.

This test procedure is applicable only to balance type vapor recovery systems and is explicitly not applicable to vapor assist type systems.

#### 2 PRINCIPLE AND SUMMARY OF TEST PROCEDURE

The principle of this test procedure is to determine the dynamic pressure of a vapor recovery system at known dispensing flow rates. Some alternative procedures are provided and one procedure shall be chosen for application appropriate to the operational

Last Amended April 2000

Repealed TP-201.4 Page 1 September 7, 2001 characteristics of the subject vapor recovery system. A novel test procedure may be developed and used which incorporates some aspects of the procedures provided.

#### 3 BIASES AND INTERFERENCES

- 3.1 Any leaks in the nozzle vapor path, vapor hose, or underground vapor return piping will result in erroneously low dynamic back pressure measurements.
- 3.2 The same procedure must be used to determine a dynamic pressure performance standard and determine compliance with that standard.

#### 4 SENSITIVITY, RANGE, AND PRECISION

#### 4.1 Sensitivity

Sensitivity of measurements of pressure and volumetric flow rate is approximately equal to the graduation interval specified for each instrument in Section 5.

#### 4.2 Range

The range of practical measurements of pressure and volumetric flow rate consistent with this test procedure is limited by the instrument range specified for each instrument in Section 5.

#### 4.3 Precision

Non-compliance with an applicable pressure limit shall be determined only when the measured pressure exceeds the applicable limit by more than 5% of the limit value or 0.02 inches of  $H_2O$ , whichever is greater.

#### **5 EQUIPMENT**

#### 5.1 Nitrogen Pressure Drop Test Unit

The unit shall consist of a suitable frame or cabinet to which the pressure measurement device, the rotameter, and the fill pipe adaptor are rigidly attached and shall be equipped with suitable leveling bubble(s) and leveling screws or other provisions for leveling the pressure measurement device and the rotameter while in use. The fill pipe shall be mounted so that nozzles will hang in the normal semi-horizontal position when inserted, and gauges shall be mounted at a height suitable for proper observation. See Figure 1.

Use a fill pipe known to be compatible with all vapor recovery nozzles and equipped with a pressure tap and a separate feeder line consisting of 1/4" or larger copper or stainless steel tubing (or teflon tubing of similar diameter and wall thickness) not longer

Last Amended April 2000

Repealed TP-201.4 Page 2 September 7, 2001 than 18" delivering nitrogen from the rotameter.

Use a high pressure nitrogen cylinder capable of maintaining a pressure of 2000 psig and equipped with a compatible two-stage pressure regulator. Use commercial grade nitrogen.

5.1.1 A fillpipe without a leaded gasoline restrictor plate, or from which the leaded gasoline restrictor plate has been removed, shall be used to avoid the pressure drop which would otherwise be caused by the restrictor plate. The pressure tap shall be located near the end of the fillpipe to which the nozzle connects, and the nitrogen feeder line shall be well separated from the pressure tap to ensure that nitrogen impinging on the pressure tap does not cause a significant pressure reading.

#### 5.2 Rotameter(s)

Use a calibrated rotameter having a range of 10-100 SCFH Air and a graduation interval no greater than 2 SCFH Air, equipped with a flow control valve. A rotameter designed for measurement of air flow rates, or calibrated against such a rotameter, shall be used and no correction for gas density shall be applied to readings when measuring nitrogen flow rates.

#### 5.3 Pressure gauge(s)

Use a pressure measuring device (either a transducer with electronic readout, an inclined manometer, or a Magnahelic gauge with a range of 0 to 1.00 inches of  $H_2O$  and a graduation interval no greater than 0.02 inches of  $H_2O$ . Additional gauges with a lesser range may be used for low-range measurements if desired.

The low pressure vent of the pressure measuring device shall be effectively shielded from the wind.

#### 5.4 Hand Pump

Use a gasoline compatible hand pump to drain condensate pots.

#### 6 CALIBRATION PROCEDURE

#### 6.1 Rotameters

Rotameters' calibration shall be checked annually at 20%, 40%, 60%, 80% and 100% of full scale against a dry gas meter, passing air (not nitrogen) through a toggle valve, thence through the rotameter at a constant rate, and thence through the dry gas meter for a measured time interval of at least one minute. If volume measured by the dry gas meter divided by the measured time interval (converted to hours) does not agree with the rotameter's indicated flow rate within 3% of that indicated flow rate or 2 CFH (whichever is greater) at each flow rate, the rotameter shall be replaced or repaired.

#### 6.2 Pressure Measurement Devices

Pressure measurement devices' calibration shall be checked annually at 20%, 40%, 60%, 80% and 100% of full scale against an inclined manometer. If pressure measured by the inclined manometer does not agree with the pressure measurement device's indicated pressure within 3% of that indicated pressure or 0.02 inches  $H_2O$  (whichever is greater) at each pressure level, the pressure measurement device shall be replaced or repaired.

#### 6.3 Assembled Nitrogen Pressure Drop Test Unit

Before first use of the nitrogen pressure drop test unit, verify that no significant pressure is indicated when a dismounted nozzle spout, or a nozzle with no boot, is inserted as in normal use and 100 CFH of nitrogen is passed through the apparatus. Passage of nitrogen through passages of the spout or nozzle shall be prevented during this test. Pressure indicated at 100 CFH flow shall be less than 0.02 inches of water.

#### 7 PRE-TEST PROTOCOL

#### 7.1 Test, Challenge, and Failure Modes for Certification Testing

The specification of test, challenge, and failure modes such as the number of liquid transfer episodes, volume and volumetric rate of liquid transfer, storage tank volumes, etc. shall be done according to the principles of CP-201 § 5 for the testing and evaluation of vapor recovery equipment. The facility and system shall be prepared to operate according to any specified test, challenge, and failure modes.

#### 7.2 System and Facility Preparation

System equipment and components shall be completely operational and, at newly constructed facilities, any storage tanks involved in the test shall have been initially filled for the first time to the appropriate volume a minimum of 24 hours prior to the

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#### 7.3 Check Facility Operating Mode

- 7.3.1 (1) If performing a test during the certification process, examine the subject facility to determine the most appropriate application of the alternative test procedures provided, giving preference to Procedure 1 except where it's use is demonstrated to be impractical. If none of these are appropriate, document those features necessary for incorporation into a novel test procedure. If reasonable and practical, make field revisions to the most appropriate procedure and proceed. Otherwise report the need for novel test procedure development.
  - (2) If performing a test to determine the compliance status of a subject facility, use the test procedure which was specified during the certification process.
- 7.3.2 For those Phase II systems which do not utilize a remote vapor check valve, use apparatus as shown in Figure 1 unless otherwise required by an ARB Executive Order applicable to the particular type of vapor recovery system. If the vapor recovery system is equipped with a device acting to reduce internal system pressure to a level below atmospheric pressure, the vacuum producing device shall be turned off during this test.

NOTE: The vapor check valve, which acts to block the vapor passage when the nozzle is not in use, is commonly located in the nozzle and actuated by compressing the bellows, but in some rare instances may be located "remotely" in or near the dispenser.

- 7.3.3 Disconnect the vapor return riser for all dispensers to be tested. Pour two to five gallons of gasoline into each vapor return riser. Allow fifteen (15) minutes for liquid in the vapor return piping to drain, then reconnect the vapor return risers.
- 7.3.3.1 If all dispensers to be tested have previously passed this test and no changes have been made to underground piping, addition of 2 gallons of gasoline to each vapor return riser may be omitted unless required by the regulatory authority having jurisdiction.

NOTE: The intention of adding liquid gasoline to the vapor return risers is to verify proper drainage of underground piping and ensure that newly constructed or modified stations which may not have had time for condensate to accumulate in any low spots in underground piping are appropriately tested.

- 7.3.4 Completely drain all gasoline from the spout and bellows.
- 7.3.5 For those vapor piping configurations which utilize a condensate pot, drain the pot prior to testing.

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- 7.3.6 All Phase I vapor poppets shall be propped open in such a manner that the valve is not damaged.
- 7.4 Check Equipment and Supplies

The test equipment must be leak-checked each day prior to use.

For the nitrogen pressure drop test unit, plug the nozzle end of the auto fill pipe with a suitable gas cap or other device and disconnect nitrogen supply line at the nitrogen cylinder. Open any toggle valves isolating the rotameter and pressure measuring device(s). With a hand pump or by blowing into the nitrogen supply line, introduce air until a pressure of approximately 1 inch of  $H_2O$  is indicated. Close the rotameter valve and observe any progressive loss of pressure. A pressure decay of up to 0.10 inches  $H_2O$ , in one minute is considered acceptable.

#### 8 TEST PROCEDURE

Each test procedure is based on direct measurements only; no sampling, recovery, or analysis is involved.

8.1 Procedure 1 - Nitrogen Pressure Test

(Systems without a Remote Vapor Check Valve)

Phase II systems which do not utilize a remote vapor check valve may be tested using the following procedure.

8.1.1 Perform an initial visual examination for vapor leaks at the nozzle and hose of the Phase II system to be tested.

NOTE: If obvious vapor leaks are present, report them and do not proceed further. This test assumes the vapor passages, including the bellows and hose, are intact.

Drain all gasoline from the spout, bellows and hose, compressing the bellows and extending the hose to ensure proper drainage.

Insert the nozzle in the fillpipe of the test apparatus, ensuring that a tight seal at the fillpipe/nozzle interface is achieved.

Open the nitrogen supply, set the delivery pressure to 10 psig, and use the rotameter control valve to adjust the flow rate to 20 CFH.

8.1.2 Observe the pressure measurement device. A pulsating pressure, if observed,

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indicates nitrogen passing through a liquid obstruction in the vapor return system. If this occurs, verify that liquid from recent "topping off" is not present in the hose as follows: close the rotameter control valve, disengage the nozzle and redrain the nozzle and hose assembly. Re-engage the nozzle, open the rotameter control valve and repeat the test. Record the measured pressure, or the midpoint of the range of measured pressures if pulsation continues.

NOTE: All mechanical gauges including rotameters, Magnahelic gauges, and inclined manometers must be read with the eye on a line normal to the scale face where the indicator rests and never from an oblique angle!

- 8.1.3 Increase the nitrogen flow rate in steps and measure the pressure drop for nitrogen flowrates of 40, 60 and 80, and 100 CFH. In certification testing or when a dispenser nozzle does not comply with an applicable dynamic back pressure limit, repeat testing (at the entire sequence of nitrogen flowrates) until dynamic pressure has been measured at each flowrate three times.
- 8.1.4 Close and replace the dust cover on the Phase I poppet after all dispenser nozzles have been tested.
- 8.1.5 Record data as instructed in the section, "RECORDING DATA".
- 8.2 Procedure 2 Torus Pressure Test

For some systems, the dynamic pressure can be measured directly during dispensing into vehicles using apparatus assembled according to the design in Figure 2; the range on the pressure gauge is for example only.

**Warning:** This procedure shall only be used as a screening procedure for the other procedures provided. If this is the only procedure with which a system is compatible, then such system shall be considered to be incompatible with the application of TP-201.4 unless an alternative procedure is developed per § 13.

- 8.2.1 Measure the dispensing rate and dynamic pressure for any fueling episode during which four or more gallons is dispensed.
- 8.2.2 Collect data at high, mid-range, and low dispensing rates for five dispensing episodes at each rate.
- 8.2.3 Record the actual dispensing rate and dynamic pressure for each dispensing episode.

#### 8.3 Procedure 3 - Fixed Volume Pressure Test

IMPORTANT: Use this procedure for compliance determinations only if specified by Executive Order applicable to the specific type of vapor recovery system being tested.

For some systems, the dynamic pressure can be measured directly during dispensing into a surrogate for a vehicle tank using apparatus assembled according to the design in Figure 3; the range on the pressure gauge is for example only.

- 8.3.1 Measure the dispensing rate (using a stopwatch and the dispenser's metered gallonage) and dynamic pressure for any fueling episode during which half of the fixed volume is dispensed.
- 8.3.2 Collect data at high, mid-range, and low dispensing rates for five dispensing episodes at each rate. Set constant dispensing rates using the nozzle's hold-open clip or a wooden wedge.
- 8.3.3 Record the dispensing time, gallons dispensed, calculated dispensing rate and dynamic pressure for each dispensing episode.

#### 9 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

This section is reserved for future specification.

#### 10 RECORDING DATA

Figure 4, for example, is the field data sheet for the procedures provided.

Data sheets for other procedures shall be composed in a similar manner, based on field operating parameters.

The following information shall be recorded on the field data sheet:

Facility Identification and Address Pump Number and Product Grade Nozzle Make and Model Nitrogen Flowrate, CFH Dynamic Back Pressure, inches H<sub>2</sub>O

#### 11 CALCULATING RESULTS

Calculate the average dynamic pressure for each dispensing rate tested at each nozzle.

#### 12 REPORTING RESULTS

Last Amended April 2000

Repealed TP-201.4 Page 8 September 7, 2001 In compliance testing, the maximum allowable dynamic back pressure for individual dispenser nozzles, with the dry breaks open, is as specified in the CARB Executive Order applicable to the specific vapor recovery system or in any applicable regulation. In certification testing, appropriate allowances for performance variations between individual dispenser nozzles and associated system components shall be made in establishing dynamic pressure limits. Dynamic pressure limits shall be applicable to individual dispenser nozzles.

#### 12.1 Procedure 1

The dynamic pressure performance of each dispenser nozzle shall be reported as the average dynamic pressure at each flow rate.

The dynamic pressure performance measured during certification shall be used as a basis for the performance standard for any installation of the subject vapor recovery system tested. The dynamic back pressure limits specified at each flow rate shall be indicative of the upper limit of the normal range of dynamic back pressures for individual dispensing nozzles at the facility during certification.

#### 12.2 Procedure 3

The dynamic pressure performance shall be reported as the average dynamic pressure at each flow rate.

The dynamic pressure performance measured during certification shall be used as a basis for the performance standard for any installation of the subject vapor recovery system tested. The dynamic back pressure limits specified at each flow rate shall be indicative of the upper limit of the normal range of dynamic back pressures for individual dispensing nozzles at the facility during certification.

#### 13 ALTERNATIVE TEST PROCEDURES

Test procedures, other than specified above, shall only be used if prior written approval is obtained from the ARB Executive Officer. In order to secure the ARB Executive Officer's approval of an alternative test procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative test procedure is equivalent to this test procedure.

(1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.

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(2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB Executive Officer's files and shall be made available upon request.

#### 14 REFERENCES

This section is reserved for future specification.

#### 15 EXAMPLE FIGURES AND FORMS

Each figure or form provides an illustration of an implementation which conforms to the requirements of this test procedure; other implementations which so conform are acceptable, too. Any specifications or dimensions provided in the figures or forms are for example only, unless such specifications or dimensions are provided as requirements in the text of this or some other required test procedure.

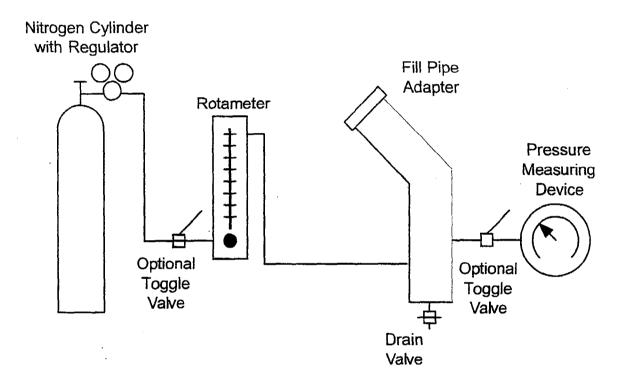
Figure 1 Typical Apparatus for Procedure 1

Figure 2
Torus Pressure Test Assembly

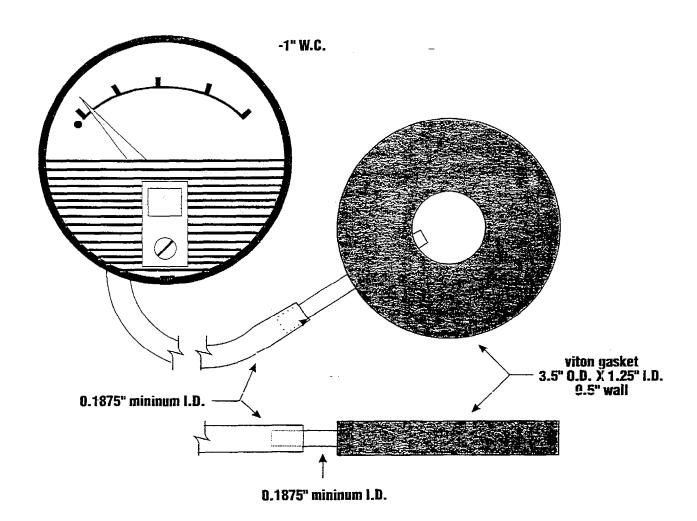
Figure 3
Fixed-Volume Pressure Test Assembly

Figure 4
Field Data Form

Figure 1 - Typical Apparatus for Procedure 1



# FIGURE 2 Torus Pressure Test Assembly



TP 201.4 F.2/ B. CORDOYA '95

Figure 3 – Fixed Volume Pressure Test Assembly

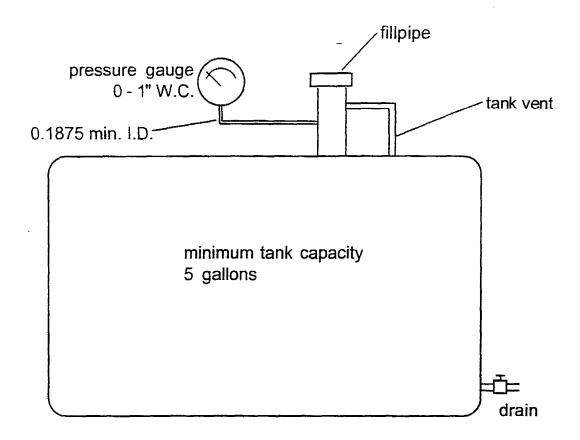


Figure 4 - Field Data Form

Facility Na Inspector Vapor Re Applicable	ame & Add covery Syste Air Resou	ress em Type rces Board	E	Dat	e_ der	-#			
Dynamic I	Pressure Li	mits from E	xe	cutive Orde  	er:	Inches of @ @ @ @	H₂O CFH I	Nitrogen	
Pump Number	Gasoline Grade	Pressure, Inches of H <sub>2</sub> O		Proc. 1 Nitrogen Flow, CFH		Proc. 3 Gallons Dispensed	Proc. 3 Time to Dispense	Proc. 3 Dispensing Rate, CFH	
		`							_

### California Environmental Protection Agency

## Air Resources Board

**Vapor Recovery Test Procedure** 

PROPOSED: TP-201.4

**Dynamic Back Pressure** 

Adopted: April 12, 1996 Amended: April 28, 2000

Amended:

Note: This procedure is being amended. For ease of viewing, the method is shown as proposed text.

## California Environmental Protection Agency Air Resources Board

#### Vapor Recovery Test Procedure

#### PROPOSED TP-201.4

#### **Dynamic Back Pressure**

Definitions common to all certification and test procedures are in:

#### **D-200 Definitions for Vapor Recovery Procedures**

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

#### 1. PURPOSE AND APPLICABILITY

- 1.1 This procedure is used to verify the applicable dynamic back pressure limits imposed on any gasoline vapor recovery system. The methodologies in this procedure are applicable for certification and compliance testing.
  - 1.1.1 **Methodology 1**. This procedure is applicable if the dynamic back pressure standards are imposed from the nozzle to the gasoline storage tank, provided remote vapor check valves are not part of the Phase II system.
  - 1.1.2 **Methodology 2**. This procedure is applicable if the dynamic back pressure standards are imposed from the nozzle to the gasoline storage tank and a remote vapor check valve is installed.
  - 1.1.3 **Methodology 3.** This procedure is applicable if the dynamic back pressure standards are imposed from the nozzle to the gasoline storage tank and a remote vapor check valve that can be disabled by removing the poppet on the fuel side is installed.
  - 1.1.4 Methodology 4. This procedure is applicable if the dynamic back pressure standards are imposed from the Phase II riser to the gasoline storage tank provided there is no vacuum-producing device located between the riser and tank.
  - 1.1.5 **Methodology 5**. This procedure is applicable if the dynamic back pressure standards are imposed at the nozzle/vehicle interface during vehicle fueling.
  - 1.1.6 **Methodology 6**. This procedure shall be conducted in conjunction with the applicable of Methodologies 1, 2, 3 or 4.

- 1.2 Unless the certification Executive Order specifies otherwise, compliance testing using Methodologies 1, 2, 3, 4 and 6 shall be conducted with the Phase I vapor poppet open, while Methodology 5 shall be conducted with the poppet closed.
- 1.3 For those systems possessing a design incompatible with this test procedure, compliance testing shall be conducted in accordance with the procedures specified in the applicable certification Executive Order. Appropriate certification testing shall be determined and conducted in accord with sound engineering principles and accepted engineering evaluation criteria.

#### 2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

2.1 Using Methodologies 1, 2, 3, 4 or 6, the dynamic back pressure during vehicle fueling is simulated by passing nitrogen through the vapor recovery system at specified rates. The resultant dynamic back pressure is measured using a pressure gauge, or equivalent device. Methodologies 2 and 3 are included for those systems that utilize both bellows-equipped nozzles and a remote vapor check valve. Methodology 5 is a direct measurement of the pressure at the nozzle/fillpipe interface during gasoline dispensing.

#### 3. BIASES AND INTERFERENCES

- 3.1 Any leaks in the nozzle vapor path, fillpipe interface, vapor hose, or underground vapor return piping may result in erroneously low dynamic back pressure measurements.
- 3.2 Testing of systems that have liquid condensate traps in the underground vapor return piping that contain liquid at the time of the test may result in erroneously high dynamic back pressure measurements.
- 3.3 Measuring dynamic back pressure without waiting a minimum of 30 seconds for the flow of nitrogen to stabilize may result in erroneous back pressure measurements.

#### 4. SENSITIVITY, RANGE AND PRECISION

- 4.1 The minimum and maximum dynamic back pressures that can be measured are dependent upon available pressure gauges. The recommended mechanical or electronic pressure gauge ranges are described in Sections 4.2 and 4.3.
- 4.2 If mechanical pressure gauges are used, the minimum diameter of the gauge face shall be four inches; the minimum accuracy shall be 3.0 percent of full scale and the minimum readability shall be 5.0 percent of full scale.
  - 4.2.1 **Methodology 1**. 0-0.5 and 0-1 inches H<sub>2</sub>O.
  - 4.2.2 **Methodology 2**. 0-0.5 and 0-1 inches H<sub>2</sub>O.
  - 4.2.3 **Methodology 3**. 0-0.5 and 0-1 inches H<sub>2</sub>O.
  - 4.2.4 **Methodology 4**. 0-0.25 inches H<sub>2</sub>O.
  - 4.2.5 **Methodology 5**. -1-0-+1 inches H<sub>2</sub>O.
  - 4.2.6 **Methodology 6.** 0-0.5 and 0-1 inches H<sub>2</sub>O.

4.3 If an electronic pressure measuring device is used, the full-scale range of the device shall not exceed 0-10 inches H<sub>2</sub>O with a minimum accuracy of 0.5 percent of full scale. A 0-20 inches H<sub>2</sub>O device may be used provided the equivalent accuracy is not less than 0.25 percent of full-scale.

#### 5. EQUIPMENT

- 5.1 Nitrogen High Pressure Cylinder with Pressure Regulator. Use a high pressure nitrogen cylinder capable of maintaining a pressure of at least 2000 psig and equipped with a compatible two-stage pressure regulator and a one psig relief valve. A ground strap is recommended during introduction of nitrogen into the system.
- **5.2** Rotameter. Use a calibrated rotameter capable of accurately measuring nitrogen flowrate(s) applicable for the imposed dynamic back pressure limits.
- **5.3** Pressure Gauges. Use differential pressure gauges as described in Sections 4.2 and 4.3.

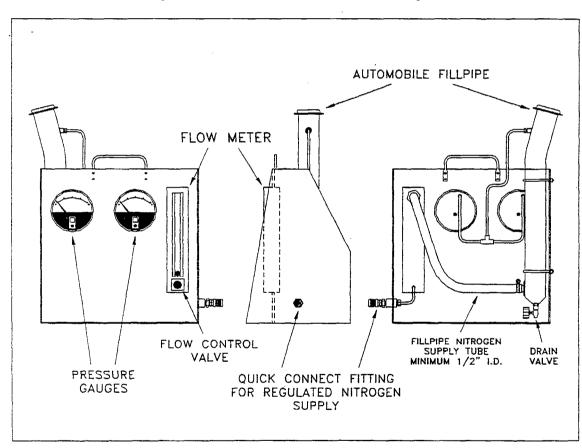


Figure 1
Dynamic Back Pressure Test Assembly

- **5.4** Fillpipe. Use an automobile fillpipe, or equivalent, known to be compatible with all bellows-equipped vapor recovery nozzles, and equipped with a pressure tap. See Figure 1.
- 5.5 Nitrogen. Use commercial grade gaseous nitrogen in a high-pressure cylinder, equipped with a two-stage pressure regulator and a one psig pressure relief valve.

- **5.6** Hand Pump. Use a gasoline compatible hand pump, if applicable, to drain any gasoline from condensate pots.
- 5.7 Stopwatch. Use a stopwatch accurate to within 0.2 seconds to time the duration of the test.
- 5.8 Gasket. Use a flat gasket made of a gasoline compatible material with dimensions similar to the donut shown in Figure 4, to ensure proper seal between the nozzle and the Dynamic Back Pressure Assembly.

#### 6. PRE-TEST PROCEDURES

- **6.1 Methodologies 1, 2 & 3.** The following subsections are applicable for those Phase II systems where a limitation is imposed on the dynamic back pressure between the nozzle and the gasoline storage tank. If a central vacuum system is used, this device shall be turned off during this test.
  - 6.1.1 Assemble a Dynamic Back Pressure Test Assembly as shown in Figure 1, ensuring that the rotameter control valve is closed.

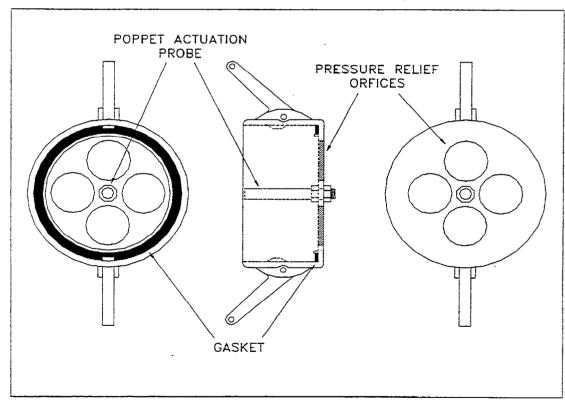


Figure 2
Dynamic Pressure Release Assembly

6.1.2 The test equipment must be leak-checked prior to use. Plug the nozzle end of the auto fillpipe on the Dynamic Back Pressure Assembly and open the nitrogen cylinder. Adjust the rotameter control valve until a pressure of 50 percent of full scale is indicated on the high range pressure gauge. Close

- the nitrogen cylinder valve and any toggle valves. A pressure decay of less than 0.2 inches H<sub>2</sub>O, in five minutes, is considered acceptable.
- 6.1.3 With the Dynamic Back Pressure Assembly open to atmosphere, flow nitrogen through the assembly at each specified flowrate. Record any back pressure on the appropriate data sheet. Allow a minimum of 30 seconds for the nitrogen flow to stabilize before taking back pressure measurement.
- 6.1.4 Perform an initial visual examination for vapor leaks at the nozzle and hose of the Phase II system to be tested. All leak sources shall be repaired or the component(s) removed and replaced prior to testing.

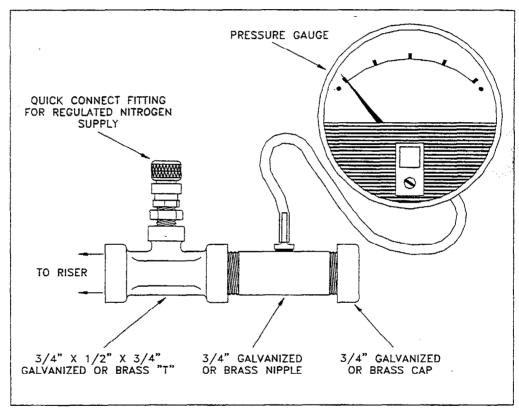


Figure 3
Capped "T" Assembly

- 6.1.5 Pour a minimum of two (2) gallons of gasoline into each Phase II vapor return riser. This gasoline may be introduced into the Phase II riser in any appropriate manner. Alternatively, a minimum of twenty gallons of gasoline may be introduced into the Phase II riser furthest from the gasoline storage tank, provided that the riser is common to all products available at that dispenser. If product-specific risers are employed, a minimum of seven gallons, per product grade, may be introduced into the riser of each product that is furthest from the gasoline storage tank. The Districts may waive this requirement in facilities that have been in operation prior to the test. Allow at least fifteen (15) minutes for the liquid in the vapor return piping to drain.
- 6.1.6 Completely drain any gasoline from the spout and bellows.

- 6.1.7 For vapor piping configurations that utilize a liquid condensate pot, drain the pot prior to testing.
- 6.1.8 The Phase I vapor poppet shall be opened in such a manner that the valve is not damaged. This may be accomplished by using either a vapor recovery elbow or a Dynamic Pressure Release Assembly, as shown in Figure 2.

#### 6.2 Methodology 4.

- 6.2.1 Assemble the Capped "T" Assembly as shown in Figure 3.
- 6.2.2 With the Capped "T" Assembly open to atmosphere, flow nitrogen through the assembly at each specified flowrate. Record any back pressure on the appropriate data sheet. Allow a minimum of 30 seconds for the nitrogen flow to stabilize before taking back pressure measurement.
- 6.2.3 Open the Phase I vapor poppet for the affected tank(s), using either methodology described in 6.1.8.

PRESSURE GAUGE

DONUT DIMENSIONS ARE 3.5" O.D. X 1.5" I.D., O.75" MINIMUM WALL

STAINLESS STEEL TUBING O.1875 MINIMUM I.D.

FLEXIBLE TUBING O.1875" MINIMUM I.D.

DONUT CONSTRUCTED OF FLEXIBLE GASOLINE RESISTANT MATERIAL

Figure 4

Donut Pressure Test Assembly

6.2.4 Pour a minimum of two (2) gallons of gasoline into each Phase II vapor return riser. This gasoline may be introduced into the riser in any appropriate manner.

#### 6.5 Methodology 5.

- 6.5.1 Assemble the Donut Pressure Test Assembly as shown in Figure 4.
- 6.5.2 The Phase I vapor poppet shall remain closed during this test.

#### 6.6 Methodology 6.

- 6.6.1 Assemble the Vent Pipe Pressure Assembly as shown in Figure 5.
- 6.6.2 With the Vent Pipe Pressure Assembly open to atmosphere, flow nitrogen through the assembly at each specified flowrate. Record any back pressure on the appropriate data sheet. Allow a minimum of 30 seconds for the nitrogen flow to stabilize before taking back pressure measurement.
- 6.6.3 Carefully remove the vent pipe pressure/vacuum (P/V) valve.
- 6.6.4 Open the Phase I vapor poppet for the affected tank(s), using either methodology described in 6.1.8.
- 6.6.5 Insure that the collection unit of the Phase II system is turned off.

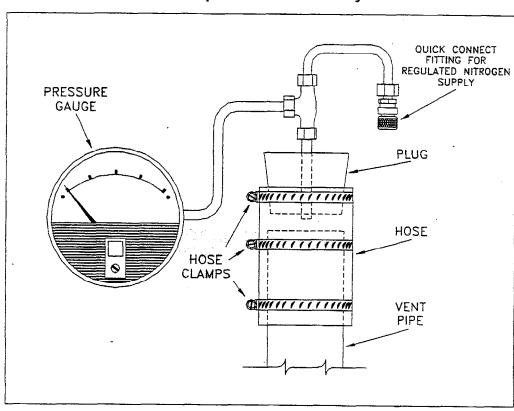


Figure 5
Vent Pipe Pressure Assembly

#### 7. TEST PROCEDURE

- 7.1 **Methodology 1.** Insert the nozzle into the fillpipe of the Dynamic Back Pressure Test Unit. Ensure that a tight seal is achieved at the fillpipe/nozzle interface. This may be accomplished with the use of a "donut" shaped gasket, as described in Section 5.8
  - 7.1.1 Connect the nitrogen supply to the test assembly.
  - 7.1.2 Open the nitrogen cylinder, set the delivery pressure to 5 psig. Use the rotameter control valve to adjust the flowrate to lowest of the required nitrogen flowrates. Care must be taken to ensure that the initial flowrate

- through the rotameter does not exceed the lowest specified in the certification Executive Order. If nitrogen has been introduced in excess of the minimum flowrate, then liquid must be introduced, pursuant to section 6.1.5, to conduct a valid test. Allow a minimum of 30 seconds for the nitrogen flow to stabilize before taking back pressure measurement.
- 7.1.3 A pulsating gauge needle indicates nitrogen passing through a liquid obstruction in the vapor return system. If this occurs, close the rotameter control valve, disengage the nozzle, and redrain the nozzle and hose assembly. Re-engage the nozzle, open the rotameter control valve and repeat Section 7.1.2.
- 7.1.4 The following information shall be recorded on the field data sheet, as shown on Form 1:
  - (a) Dispenser Number and Product Grade
  - (b) Nozzie manufacturer and model
  - (c) Nitrogen flowrate, CFH
  - (d) Dynamic back pressure, inches H<sub>2</sub>O
- 7.1.5 Repeat Sections 7.1.1 through 7.1.4 for each additional nitrogen flowrate specified in the certification Executive Order, from the lowest remaining flowrate to the highest.
- 7.1.6 Remove the vapor recovery elbow or Dynamic Pressure Release Assembly from the Phase I poppet and replace the dust cap.
- **7.2 Methodology 2.** Phase II balance and Hirt systems, which utilize both bellowsequipped nozzles and a fuel-activated remote vapor check valve, may be tested using the following methodology.
  - 7.2.1 Disconnect the vapor recovery hose from the remote vapor check valve. Test the nozzle/hose assembly pursuant to Section 7.1.1 through 7.1.4, and record the results on the field data sheet as shown in Form 2.
  - 7.2.2 Disconnect the vapor check valve and connect a compatible "T" fitting, as shown in Figure 3, to the dispenser at that location.
  - 7.2.3 Connect the nitrogen supply to the "T" assembly.
  - 7.2.4 Repeat Sections 7.1.2 through 7.1.5. In addition to the information required in Section 7.1.4, record both the make and model of the remote vapor check valve.
  - 7.2.5 Record on the field data sheet the pressure drop across the remote vapor check valve. This data is available from the manufacturer.
  - 7.2.6 Add the dynamic back pressures, for each required nitrogen flowrate, obtained from Sections 7.2.1, 7.2.4 and 7.2.5 as shown in Form 2.
  - 7.2.7 Disconnect the "T" fitting from the dispenser and re-connect the vapor check valve.
  - 7.2.8 Remove the vapor recovery elbow or Dynamic Pressure Release Assembly from the Phase I poppet and replace the dust cap.

- 7.3 Methodology 3. Phase II balance and Hirt systems which use both bellows-equipped nozzles and those models of fuel-activated remote vapor check valves which can be disabled by removing the poppet on the fuel side may be tested using the following methodology. Phase II systems using an Emco-Wheaton A-228 remote vapor check valve cannot be tested using this methodology.
  - 7.3.1 Carefully open the fuel side of the remote vapor check valve and remove the fuel poppet. Carefully replace the threaded plug on the fuel side of the valve.
  - 7.3.2 Test the Phase II system pursuant to Sections 7.1.1 through 7.1.5, recording the data on the field data sheet shown in Form 1.
  - 7.3.3 Carefully reassemble the remote vapor check valve by removing the plug on the fuel side and reinserting the fuel poppet. Replace the threaded fuel plug, taking care not to strip the threads.
  - 7.3.4 Remove the vapor recovery elbow or Dynamic Pressure Release Assembly from Phase I poppet and replace dust cap.
- 7.4 Methodology 4. Those Phase II systems subject to regulatory limitations on the dynamic back pressure between the Phase II riser and gasoline storage tank may be tested using this methodology.
  - 7.4.1 Disconnect the Phase II vapor riser and install the "T" assembly as shown in Figure 3.
  - 7.4.2 Connect the nitrogen supply to the "T" assembly.
  - 7.4.3 Open the nitrogen cylinder, set the delivery pressure to 5 psig. Use the rotameter control valve to adjust the flowrate to lowest of the required nitrogen flowrates. Care must be taken to ensure that the initial flowrate through the rotameter does not exceed the lowest specified in the Executive Order. If nitrogen has been introduced in excess of the minimum flowrate, then liquid must be introduced, pursuant to section 6.1.5, to conduct a valid test. Allow a minimum of 30 seconds for the nitrogen flow to stabilize before taking back pressure measurement.
  - 7.4.4 A pulsating gauge needle indicates nitrogen passing through a liquid obstruction in the vapor return system. If this occurs, close the rotameter control valve, disengage the nozzle, and redrain the nozzle and hose assembly. Re-engage the nozzle, open the rotameter control valve and repeat Section 7.4.3.
  - 7.4.5 The following information shall be recorded on the field data sheet, as shown in Form 3:
    - (a) Dispenser Number and Product Grade
    - (b) Nitrogen flowrate, CFH
    - (c) Dynamic back pressure, inches H₂O
  - 7.4.6 Repeat subsections 7.4.3 through 7.4.5 for all required nitrogen flowrates, as specified in CP-201.
  - 7.4.7 Remove the "T" assembly and re-connect the Phase II vapor riser.

- 7.4.8 Remove the vapor recovery elbow or Dynamic Pressure Release Assembly from the Phase I poppet and replace the dust cap.
- 7.5 **Methodology** 5. Those bellows-equipped Phase II systems subject to regulatory limitations on the dynamic back pressure at the nozzle/fillpipe interface during gasoline dispensing shall use the following methodology.
  - 7.5.1 Assemble the Donut Pressure Test Assembly, shown in Figure 4.
  - 7.5.2 Insert the nozzle spout through the inner hole of the donut.
  - 7.5.3 Insert and latch the nozzle in the vehicle fillpipe. Visually ensure that a tight connection is made between the donut and fillpipe.
  - 7.5.4 Activate the dispenser and set the nozzle hold-open latch on low. After at least one gallon has been dispensed start the stopwatch. Dispense a minimum of four gallons of gasoline. The following data shall be recorded on the field data sheet as shown in Form 4:
    - (a) Dispenser Number and gasoline grade
    - (b) Gallons dispensed during test
    - (c) Maximum dynamic back pressure, inches H<sub>2</sub>O
    - (d) Minimum dynamic back pressure, inches H<sub>2</sub>O
    - (e) The average dispensing rate, gallons per minute
  - 7.5.5 This Methodology shall only be conducted with the Phase I vapor poppet closed, since gasoline is being dispensed during the test.
- **7.6 Methodology 6.** This procedure verifies proper drainage of gasoline from the base of the vent pipe to the gasoline storage tank.
  - 7.6.1 After verifying certification or compliance with the dynamic back pressure standards, pursuant to the applicable of Methodologies 1, 2, 3, or 4, close the Phase I vapor poppet.
  - 7.6.2 Remove the pressure/vacuum (P/V) valve(s) from each vent pipe.
  - 7.6.3 Carefully pour a minimum of 5 gallons of gasoline down each vent pipe.
  - 7.6.4 Wait at least 15 minutes.
  - 7.6.5 Open the Phase I poppet(s) on all affected tanks, per section 6.1.8.
  - 7.6.6 Install the Vent Pipe Pressure Assembly as shown in Figure 5.
  - 7.6.7 Connect the nitrogen supply to the Vent Pipe Pressure Assembly.
  - 7.6.8 Open the nitrogen cylinder and adjust the flowrate to 60 CFH.
  - 7.6.9 After a minimum of 30 seconds, record the dynamic back pressure.
  - 7.6.10 A dynamic back pressure, from the top of the vent pipe to the storage tank, of less than 0.5 inches H<sub>2</sub>O shall be considered acceptable.
  - 7.6.11 Repeat steps 7.6.6 through 7.6.10 for each vent stack that has a P/V valve.
  - 7.6.12 Remove the Vent Pipe Pressure Assembly from the vent pipe and replace the pressure/vacuum (P/V) valve(s).

7.6.13 Remove the vapor recovery elbow or Dynamic Pressure Release Assembly from the Phase I poppet and replace the dust cap.

#### 8. POST-TEST PROCEDURES

Refer to each methodology for the appropriate post-test procedure.

#### 9. REPORTING RESULTS

9.1 Report the results of the dynamic back pressure test as shown below:

9.1.1	Methodology 1	Form 1
9.1.2	Methodology 2	Form 2
9.1.3	Methodology 3	Form 1
9.1.4	Methodology 4	Form 3
9.1.5	Methodology 5	Form 4
916	Methodology 6	Forms 1 2 3 or 4 as appropriate

#### 10. ALTERNATE PROCEDURES

10.1 This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the ARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

### Form 1

	Dynamic Back Pressu Source Test Results	Report No.:    Test Date:    Test Times:   Run A:
Sou	urce Information	Representatives
Station Name and Address	Station Representative and Title	Source Test Engineers
	Phone No. ( )	
Permit Conditions:	Source: GDF Vapor Recovery	Permit Services Division/Enforcement Division
	GDF #	Test Requested By:
Operating Parameters: Applicable Regulations:		VN Recommended
Sources Test Results		-
Nozzle # Gas Grade	Nozzie Model	Oynamic Back Pressure, Inches H <sub>2</sub> O  CFH  CFH  CFH  CFH  CFH  CFH  CFH  CF
Results Received by Date	Results Reviewed by Date	Results Approved/Disapproved

Source: GDF Vapor Recovery GDF # AC#   Test Determined by:  Source: GDF Vapor Recovery GDF # AC#   VN Recommendation:  Source: GDF Vapor Recovery GDF # AC#   VN Recommendation:  Source: GDF Vapor Recovery GDF # AC#   VN Recommendation:  Source: GDF Vapor Valve   VN Vapo	Station Name and Address				Station Rel Phone No.	Station Representative and Title Phone No. (	
Is and Comments:  Source: GDF Vapor Recovery GDF # AC#   VN Recontining fation:  Nozzle Vapor Valve   NozzleHose   NozzleHose   NozzleHose   NozzleHose   NozzleHose   Tank   Tank   Tank   NozzleHose	ement:			Sack Pressure	Test Perf	ormed by:	ì
Isource: GDF Vapor Recovery GDF # A/C #   VNN Recommends:  Dynamic Back Pressure, Inches of Water Colum NozzleHose Riser to U.G. Vapor Valve Nitrogen Assembly Tank  Model Flow, CFH Assembly Tank  Inches of Water Colum Assembly Tank		40.554	Source	Test Results	Test Date	s/Time:	-
or Valve Nitrogen Nozzle/Hose Riser to U.G. Vapor Valve Assembly Tank Tank I.e. (CHA Assembly Tank Tank I.e. (CHA Assembly Tank Tank I.e. (CHA Assembly I.e. (CHA Assemb		Soul	rce: GDF Vapor Recovery	GDF#		mmendation:	
Nozzle Vapor Valve Nitrogen Nozzlef-Hose Riser to U.G. Vapor Valve Model Flow, CFH Assembly Tank  Model Make/Model Flow, CFH Assembly Tank  A	ilts and	Comments:			1		
Nodel Make/Model Flow, CFH Assembly Tank Assembly Tank	-			Dynamic	Back Pressure, In	iches of Water Col	- umr
				Nozzie/Hose Assembly	Kiser to U.G. Tank	vapor valve	Total ∆ P, Inches H <sub>2</sub> 0
	.						
							-
						-	
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	Dynamic Back Pre Source Test Res		Test Date:  Test Times:  Run A:	
Sc	ource Information	R	Representativ	es
Station Name and Address	Station Representative and Title  Phone No. ( )	Source Test	Engineers	
Permit Conditions:	Source: GDF Vapor Recovery	Permit Service Division	ces Division/Enford	cement -
·	GDF #	Test Reques	ted By:	
Operating Parameters:	<u></u>		s lineada a la serie de la colonia de la	
Applicable Regulations Sources Test Resul		VN-Recom	NUCLIOISO:	
Riser # Gas Grade		Dynamic Back  CFH	CFH	CFH
Results Received by	Date Results Reviewed by	Date Results Ap	pproved/Disapproved	trigger)

#### Form 4

	_	Dynamic Back Pressure Source Test Results			
	urce Information			***	ves
Station Name and Address	Station Representative and Title  Phone No. ( )		Source Test I	Engineers	
Permit Conditions:	Source: GDF Vapor Recovery		Permit Service Division	es Division/Enfo	orcement
	GDF #		Test Request	ed By:	
Operating Parameters: Applicable Regulations:			VN Recom	mended	
Sources Test Results					
Nozzle # Gas Grad		Dynamic	Back Pressu	ire, In. H₂O	_
		Max. E	3.P. N	Min. B.P.	Rate, GPM
<u> </u>					
Results Received by	Date Results Reviewed by	Dat	te Results Ap	proved/Disapprove	

## California Environmental Protection Agency



**Vapor Recovery Test Procedure** 

PROPOSED TP - 201.6C

**Compliance Determination of Liquid Removal Rate** 

Adopted:	
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Note: All text is proposed for adoption. As authorized by title 2, California Code of Regulations, Section 8, underline to indicate addition or adoption of the regulations is omitted.

# California Environmental Protection Agency Air Resources Board

# **Vapor Recovery Test Procedure**

## TP-201.6C

# Compliance Determination of Liquid Removal Rate

A set of definitions common to all certification and test procedures is in:

# D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer or his or her authorized representative or designate.

## 1. PURPOSE AND APPLICABILITY

1.1 This procedure is used to quantify the removal rate of liquid from the vapor passage of a Phase II balance system hose equipped with a liquid removal device. This procedure determines compliance with the performance standard defined in the Certification Procedure CP-201 for the purposes of certification and for determining gasoline dispensing facilities compliance.

## 2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

2.1 This test procedure provides two options to determine the compliance of liquid removal devices. Under option 1 (short version), liquid in the vapor path of a coaxial hose is drained and measured. If the volume of liquid drained equals or exceeds 25 ml, a liquid removal test is conducted. For those hoses with less than 25 ml drained, no further testing is required. Under option 2 (long version), all hoses are evaluated regardless of the volume of liquid drained. Option 2 includes a prewetting and wall adhesion step. Both options test the liquid removal device by introducing gasoline into the vapor path of the coaxial hose through the nozzle bellows. After 7.5 gallons of gasoline is dispensed, the amount of gasoline remaining in the hose is measured and the liquid removal rate is determined. The district shall specify which testing option to be used.

## 3. BIASES AND INTERFERENCES

- 3.1. Slits or tears in the hose or nozzle vapor path may bias the results towards compliance.
- 3.2. Any spillage of liquid when draining or introducing gasoline invalidates the test.
- 3.3. A breach of the inner product hose may introduce additional gasoline into the outer vapor

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path resulting in a larger volume drained than introduced.

3.4. Incorrect nozzle and/or hose orientation while dispensing invalidates the test.

## 4. SENSITIVITY, RANGE, AND PRECISION

- 4.1 The range of measurement of the liquid removal rate is dependent upon the range of the graduated cylinder used for testing.
- **4.2** To ensure precision, graduated cylinder readings shall be measured at the liquid level meniscus.

## 5. EQUIPMENT

- 5.1. Stopwatch. Use a stopwatch accurate to within 0.2 seconds.
- **5.2.** Funnels. Large and small gasoline compatible, non-breakable, funnels with dimensions similar to those as shown in Figure 1, or equivalent.
- 5.3. Tape Measure. Use a standard tape measure with a minimum length of 5 feet.
- 5.4. Graduated Cylinders. Gasoline compatible, non-breakable 0-25ml, 0-100ml, 0-250 ml, and 0-500 ml graduated cylinders with stable base plates. The 25ml cylinder may be necessary to quantify volumes of liquid less than 20 ml.
- 5.5. Gasoline Test Tank. (Optional) A portable tank, meeting fire safety requirements for use with gasoline, may be used to receive the gasoline dispensed during testing. The tank shall have sufficient volume so that at least 10.0 gallons may be dispensed prior to activating the primary shutoff mechanism of the nozzle. The tank shall be constructed with a fill pipe opening meeting the specifications listed in Sections 6.12 and 6.13 of this procedure. To minimize testing-related emissions, vehicle refueling events should be used for this procedure whenever feasible.
- 5.6. Traffic Cones. Use traffic cones to encircle the area where testing is conducted.
- 5.7. Spout Measurement Angle Device. Use an angle measurement device to ensure the nozzle spout is resting in the vehicle or test tank fill pipe at an angle of 30° (± 5°) degrees from horizontal during dispensing. A typical way to do this is to use a spout angle measurement device, as shown in Figure 2.
- **5.8.** Field Data Sheet. Use the appropriate data sheet to record liquid removal test information. Form 1 and 2 serves as examples; districts may require a modified version.
- **5.9.** Gasoline Container. Use a portable fuel container equipped with a tight fitting cap, of at least 1.0 gallon capacity.

NOTE: THIS TEST PROCEDURE PROVIDES TWO OPTIONS TO DETERMINE COMPLIANCE OF LIQUID REMOVAL DEVICES. THE DISTRICT SHALL SPECIFY WHICH TESTING OPTION TO BE USED

## 6. OPTION 1 (SHORT VERSION)

## PRE-TEST PROCEDURE

- 6.1 Verify that the 500 ml graduated cylinder is empty. Position the large funnel into the graduated cylinder.
- **6.2** Remove the nozzle from the dispenser and carefully tilt the spout into the funnel/graduated cylinder assembly.
- 6.3 Lower the nozzle and funnel/graduated cylinder assembly as close to the ground as possible. "Walk out" the hose while keeping the nozzle lowered and hose fully extended. The hose shall slope downward from the dispenser toward the nozzle.
- 6.4 Open the nozzle's vapor check valve by compressing the bellows. Allow 60 seconds for all liquid to drain. Use caution to avoid spillage.
- 6.5 Return the nozzle to the dispenser and measure the volume of liquid drained. If the volume drained is less than 200 ml, transfer the liquid into an appropriately sized graduated cylinder. For example, if 40 ml of liquid was drained, use the 100 ml graduated cylinder to take the measurement.
- **6.6** Record the amount of liquid drained on Form 1.
- 6.7 If the volume drained is greater than or equal to 25 ml, proceed to Section 6.8 of the procedure. Hoses with greater than 25 ml drained are considered to be pre-wetted. If the amount drained is less than 25 ml, proceed to the next nozzle/hose to be evaluated and repeat Section 6.1-6.6

## TEST PROCEDURE (FOR HOSES WITH GREATER THAN 25 ML DRAINED)

- 6.8 Pour 150 ml to 175 ml of gasoline into the 250 ml graduated cylinder. Measure and record this volume on Form 1.
- 6.9 Remove the nozzle from the dispenser and position the nozzle upright so that the spout is in a vertical position.
- 6.10 Open the nozzle's vapor check valve by compressing the bellows and carefully insert the stem of the small funnel between the bellows and nozzle spout.
- **6.11** Pour the measured volume into the vapor path of the hose. Use caution not to spill the gasoline (see Section 3.2). Remove the small funnel after the gasoline has been introduced.
- 6.12 Position a vehicle or test tank fill pipe opening 48 (±6) inches from the dispenser

measured perpendicular to the nozzle hanger and 30 (±6) inches above grade. Use the tape measure to verify these distances. See Figure 3.

- 6.13 Insert the nozzle into the fill pipe. Use the angle measuring device to ensure the spout shall rest in the vehicle or test tank fill pipe at an angle of +30° (±5°) measured from horizontal. See Figure 3.
- 6.14 Dispense 7.5 (±0.5) gallons at the highest possible flow rate by holding the nozzle lever in the fully open position. Use a stopwatch to measure the time elapsed while dispensing. Record the volume of fuel dispensed and the elapsed time on a Form 1.
- 6.15 Calculate the dispensing rate using the equation below. If the dispensing rate is less than 5.0 gallons per minute (GPM), or a minimum rate approved by the Executive Officer as being consistent with normal operation, the test results are invalid. If the dispensing rate is greater than 10.0 GPM the test results are invalid.

$$GPM = 60 \times (G/T)$$

Where:

GPM = dispensing rate (in gallons per minute)

G = gallons of fuel dispensed

T = number of seconds required to dispense

- 6.16 Using the 250 ml graduated cylinder and large funnel, carefully drain the remaining liquid from the vapor path of the hose as described in Section 6.1 through 6.5. Record this quantity on Form 1.
- 6.17 If the liquid removal rate is less than 5.0 ml/gallon, but greater than or equal to 4.5 ml/gallon, repeat the test two additional times and average the three results.

## 7. OPTION 2 (LONG VERSION)

## PRETEST PROCEDURE

- 7.1 Carefully pour 150 ml of gasoline into the 250 ml graduated cylinder.
- 7.2 Remove the nozzle from the dispenser and position the nozzle upright so that the spout is in a vertical position.
- 7.3 Open the nozzle's vapor check valve by compressing the bellows and insert the small funnel between the bellows and nozzle spout.
- 7.4 Pour the gasoline from the 250 ml graduated cylinder into the vapor path of the hose. Use caution not to spill the gasoline (see Section 3.2). Remove the small funnel after the gasoline has been introduced.
- 7.5 Verify that the 500 ml graduated cylinder is empty. Position the large funnel into the graduated cylinder.

- **7.6** Remove the nozzle from the dispenser and carefully tilt the spout into the funnel/graduated cylinder assembly.
- 7.7 Lower the nozzle and funnel/graduated cylinder assembly as close to the ground as possible. "Walk out" the hose while keeping the nozzle lowered and hose fully extended. The hose shall slope downward from the dispenser toward the nozzle.
- 7.8 Open the nozzle's vapor check valve by compressing the bellows. Allow 60 seconds for all liquid to drain. Use caution to avoid spillage (see Section 3.2). If necessary, drain full graduated cylinders into a portable gas can until the hose is empty.
- **7.9** Return the nozzle to the dispenser.

#### TEST PROCEDURE

- **7.10** Pour 150 ml to 175 ml of gasoline into the 250 ml graduated cylinder. Measure and record this volume on Form 2.
- 7.11 Remove the nozzle from the dispenser and position the nozzle upright so that the spout is in a vertical position.
- 7.12 Open the nozzle's vapor check valve by compressing the bellows and carefully insert the stem of the small funnel between the bellows and nozzle spout.
- 7.13 Pour the measured volume into the vapor path of the hose. Use caution not to spill the gasoline (see Section 3.2). Remove the small funnel after the gasoline has been introduced.
- 7.14 Position a vehicle or test tank fill pipe opening 48 (±6) inches from the dispenser measured perpendicular to the nozzle hanger and 30 (±6) inches above grade. Use the tape measure to verify these distances. See Figure 3.
- 7.15 Insert the nozzle into the fill pipe. Use the spout angle measurement device to ensure the spout shall rests in the vehicle or test tank fill pipe at an angle of +30° (±5°) measured from horizontal. See Figure 3.
- 7.16 Dispense 7.5 (±0.5) gallons at the highest possible flow rate by holding the nozzle lever in the fully open position. Use a stopwatch to measure the time elapsed while dispensing. Record the volume of fuel dispensed and the elapsed time on a form similar to that as shown in Form 2.
- 7.17 Calculate the dispensing rate using the equation below. If the dispensing rate is less than 5.0 gallons per minute (GPM), or a minimum rate approved by the Executive Officer as being consistent with normal operation, the test results are invalid. If the dispensing rate is greater than 10.0 GPM the test results are invalid.

$$GPM = 60 \times (G/T)$$

Where:

GPM = dispensing rate (in gallons per minute)

G = gallons of fuel dispensed

T = number of seconds required to dispense

- 7.18 Using the 250 ml graduated cylinder and large funnel, carefully drain the remaining liquid from the vapor path of the hose as described in Section 7.5 through 7.8. Record this quantity on Form 2.
- 7.19 Use the 250 ml graduated cylinder and small funnel to pour 150 ml of gasoline into the vapor passage of the hose. Dispense no gasoline.
- 7.20 Using the 250 ml graduated cylinder and large funnel, completely drain the gasoline from the vapor passage back into the graduated cylinder as described in Section 7.5 through 7.9
- 7.21 Subtract the volume drained (value from Section 9.11) from the volume added (value from Section 9.4). This value represents the volume of gasoline lost due to wall adhesion. The purpose of the wall adhesion value is to quantify the amount of gasoline lost to evaporation from transfer to and from the graduated cylinders and adhesion of liquid to vapor passage surfaces in previous measurements.
- 7.22 If the liquid removal rate is less than 5.0 ml/gallon, but greater than or equal to 4.5 ml/gallon, repeat the test two additional times and average the three results.

## 8. POST TEST PROCEDURES

- 8.1. Empty all containers and return any excess gasoline to the underground storage tank.
- 8.2. Remove the traffic cones from the testing area.
- **8.3**. Use Equation 9.1 or 9.2 to calculate the liquid removal rate for all the applicable hoses tested.

## 9. CALCULATING RESULTS

9.1 If using OPTION 1(short version), the liquid removal rate shall be calculated as follows:

$$VR = \frac{VI - VF}{G}$$

Where:

VR = Gasoline removed per gallon dispensed, milliliters/gallon
VI = Total initial volume poured into hose vapor passage, milliliters
VF = Volume of gasoline remaining in the hose vapor passage after dispensing, milliliters

G = Total dispensed, gallons

9.2 If using OPTION 2 (long version), the liquid removal rate shall be calculated as follows:

$$VR = \frac{(VI - VW) - VF}{G}$$

Where:

VR = Gasoline removed per gallon dispensed, milliliters/gallon
VI = Total initial volume poured into hose vapor passage, milliliters
VW = Volume of liquid lost due to wall adhesion, milliliters
VF = Volume of gasoline remaining in the hose vapor passage after dispensing, milliliters
G = Total dispensed, gallons

## 10. REPORTING RESULTS

- **10.1.** Record all applicable liquid removal rate information on the appropriate form as shown in form 1 and 2
- **10.2.** If the calculated liquid removal rate is greater than or equal to the minimum removal rate as specified in CP-201, the liquid removal device has demonstrated compliance.
- **10.3**. If the calculated liquid removal rate is less than the minimum required, the liquid removal device is not in compliance.

## 11. ALTERNATIVE TEST PROCEDURES

11.1. This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

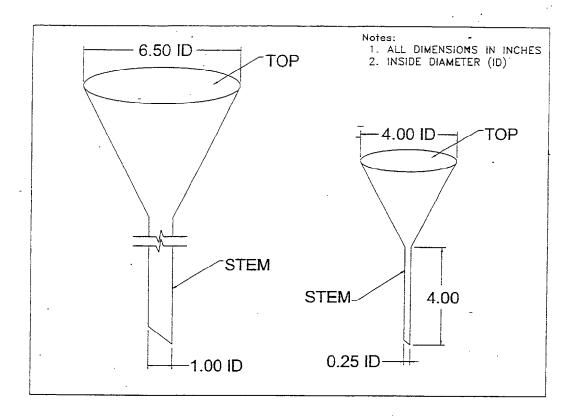
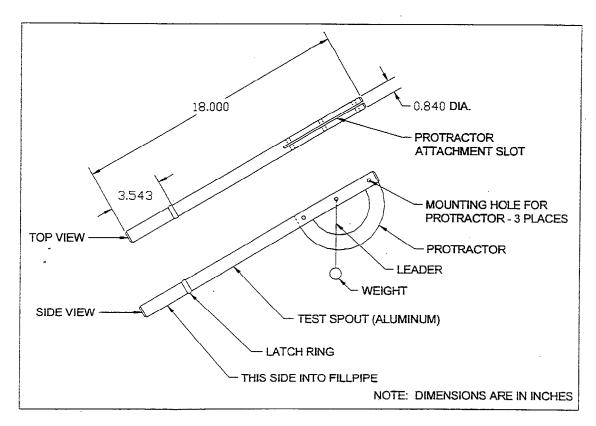


FIGURE 1: FUNNEL SPECIFICATIONS

FIGURE 2: SPOUT ANGLE MEASURMENT DEVICE



Notes:

1. ALL DIMENSIONS IN INCHES

FILLPIPE SHALL BE POSITIONED
PERPENDICULAR TO NOZZLE HANGER

PICK UP POINT FOR
LIQUID REMOVAL DEVICE

SPOUT SHALL REST IN FILLPIPE
AT AN ANGLE OF 30° ±5°
MEASURED FROM HORIZONTAL

48 ±6

FIGURE 3: NOZZLE AND HOSE POSITIONING FOR LIQUID REMOVAL TESTING

(OPTION 1)	Test Date A/C or Permit No. Testing Company		anyor		ie Liquid 1g in Removal Rate (VF) in mL/dal				-	-					٠	
			Inspector	Inspect		Volume Remaining in mL (VF)			-		i	·				-
					Dispensing Rate (60*(G/T))								•			
FORM 1: TP-201.6C LIQUID REMOVAL TEST DATA SHEET (OPTION 1)	A STATE OF THE BOOK OF THE STATE OF THE STAT			TEST RUN	Seconds to Dispense					-						
					Gallons Dispensed (G)											
					Volume Poured Into Hose in mL (VI)					-						
			Phone No.	PRE-TEST	Volume Drained From Hose in mL											
	[881.02.02.02.02.02.02.02.02.02.02.02.02.02.		J	NO	Make & Model of Hose											
		•		GENERAL INFORMATION	Make & Model of Nozzle											
				GENERA												
					Dispenser Product Number Grade											

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							••
((VI-VW)-VF)/G Removal Rate, ml/gallon			-				
(VW) Liquid Gasoline Lost With No Dispensing							
(VF) Liquid Gasoline Remaining, ml							
60(G)/(T) Dispensing Rate, GPM							
(T) Time to Dispense, Seconds					·		
(G) Gallons Dispensed				-			
(VI) Liquld Gasoline Added, ml							
Gasoline Grade							
Pump Number							

California Air Resources Board

Appendix 3

Vapor Recovery Health and Safety Code Statutes

# H&S 41950 Vapor Recovery Systems for Stationary Gas Tanks

41950. (a) Except as provided in subdivisions (b) and (e), no person shall install or maintain any stationary gasoline tank with a capacity of 250 gallons or more which is not equipped for loading through a permanent submerged fill pipe, unless such tank is a pressure tank as described in Section 41951, or is equipped with a vapor recovery system as described in Section 41952 or with a floating roof as described in Section 41953, or unless such tank is equipped with other apparatus of equal efficiency which has been approved by the air pollution control officer in whose district the tank is located.

- (b) Subdivision (a) shall not apply to any stationary tanks installed prior to December 31, 1970.
- (c) For the purpose of this section, "gasoline" means any petroleum distillate having a Reid vapor pressure of four pounds or greater.
- (d) For the purpose of this section, "submerged fill pipe" means any fill pipe which has its discharge opening entirely submerged when the liquid level is six inches above the bottom of the tank. "Submerged fill pipe," when applied to a tank which is loaded from the side, means any fill pipe which has its discharge opening entirely submerged when the liquid level is 18 inches above the bottom of the tank.
- (e) Subdivision (a) shall not apply to any stationary tank which is used primarily for the fueling of implements of husbandry.

(Added by Stats. 1975, Ch. 957.)

## **H&S 41951 Definition of Pressure Tank**

41951. A "pressure tank" is a tank which maintains working pressure sufficient at all times to prevent hydrocarbon vapor or gas loss to the atmosphere.

(Added by Stats. 1975, Ch. 957.)

# H&S 41952 Definition of Vapor Recovery System

41952. A "vapor recovery system" consists of a vapor gathering system capable of collecting the hydrocarbon vapors and gases discharged and a vapor disposal system capable of processing such

hydrocarbon vapors and gases so as to prevent their emission into the atmosphere, with all tank gauging and sampling devices gastight except when gauging or sampling is taking place.

(Added by Stats. 1975, Ch. 957.)

# **H&S 41953 Definition of Floating Roof**

41953. A "floating roof" consists of a pontoon-type or double-deck-type roof, resting on the surface of the liquid contents and equipped with a closure seal, or seals, to close the space between the roof edge and tank wall. The control equipment required by this section shall not be used if the gasoline or petroleum distillate has a vapor pressure of 11.0 pounds per square inch absolute or greater under actual storage conditions. All tank gauging and sampling devices shall be gastight except when gauging or sampling is taking place.

(Added by Stats. 1975, Ch. 957.)

# **H&S 41954 ARB Shall Certify Vapor Recovery Systems**

- 41954. (a) The state board shall adopt procedures for determining the compliance of any system designed for the control of gasoline vapor emissions during gasoline marketing operations, including storage and transfer operations, with performance standards that are reasonable and necessary to achieve or maintain any applicable ambient air quality standard.
- (b) The state board shall, after a public hearing, adopt additional performance standards that are reasonable and necessary to ensure that systems for the control of gasoline vapors resulting from motor vehicle fueling operations do not cause excessive gasoline liquid spillage and excessive evaporative emissions from liquid retained in the dispensing nozzle or vapor return hose between refueling events, when used in a proper manner. To the maximum extent practicable, the additional performance standards shall allow flexibility in the design of gasoline vapor recovery systems and their components.
- (c) (1) The state board shall certify, in cooperation with the districts, only those gasoline vapor control systems that it determines will meet the following requirements, if properly installed and maintained:
- (A) The systems will meet the requirements of subdivision (a).
- (B) With respect to any system designed to control gasoline vapors

during vehicle refueling, that system, based on an engineering evaluation of that system's component qualities, design, and test performance, can be expected, with a high degree of certainty, to comply with that system's certification conditions over the warranty period specified by the board.

- (C) With respect to any system designed to control gasoline vapors during vehicle refueling, that system shall be compatible with vehicles equipped with onboard refueling vapor recovery (ORVR) systems.
- (2) The state board shall enumerate the specifications used for issuing the certification. After a system has been certified, if circumstances beyond the control of the state board cause the system to no longer meet the required specifications or standards, the state board shall revoke or modify the certification.
- (d) The state board shall test, or contract for testing, gasoline vapor control systems for the purpose of determining whether those systems may be certified.
- (e) The state board shall charge a reasonable fee for certification, not to exceed its actual costs therefor. Payment of the fee shall be a condition of certification.
- (f) No person shall offer for sale, sell, or install any new or rebuilt gasoline vapor control system, or any component of the system, unless the system or component has been certified by the state board and is clearly identified by a permanent identification of the certified manufacturer or rebuilder.
- (g) (1) Except as authorized by other provisions of law and except as provided in this subdivision, no district may adopt, after July 1, 1995, stricter procedures or performance standards than those adopted by the state board pursuant to subdivision (a), and no district may enforce any of those stricter procedures or performance standards.
- (2) Any stricter procedures or performance standards shall not require the retrofitting, removal, or replacement of any existing system, which is installed and operating in compliance with applicable requirements, within four years from the effective date of those procedures or performance standards, except that existing requirements for retrofitting, removal, or replacement of nozzles with nozzles containing vapor-check valves may be enforced commencing July 1, 1998.
- (3) Any stricter procedures or performance standards shall not be

implemented until at least two systems meeting the stricter performance standards have been certified by the state board.

- (4) If the certification of a gasoline vapor control system, or a component thereof, is revoked or modified, no district shall require a currently installed system, or component thereof, to be removed for a period of four years from the date of revocation or modification.
- (h) No district shall require the use of test procedures for testing the performance of a gasoline vapor control system unless those test procedures have been adopted by the state board or have been determined by the state board to be equivalent to those adopted by the state board, except that test procedures used by a district prior to January 1, 1996, may continue to be used until January 1, 1998, without state board approval.
- (i) With respect to those vapor control systems subject to certification by the state board, there shall be no criminal or civil proceedings commenced or maintained for failure to comply with any statute, rule, or regulation requiring a specified vapor recovery efficiency if the vapor control equipment which has been installed to comply with applicable vapor recovery requirements meets both of the following requirements:
- (1) Has been certified by the state board at an efficiency or emission factor required by applicable statutes, rules, or regulations.
- (2) Is installed, operated, and maintained in accordance with the requirements set forth in the document certification and the instructions of the equipment manufacturer.

(Amended by Stats. 2000, Ch. 729, Sec. 14.)

References at the time of publication (see page iii):

## Regulations:

17, CCR, sections 94006, 94010, 94011, 94012, 94013, 94014, 94015, 94148, 94149, 94150, 94151, 94152, 94153, 94154, 94155, 94156, 94157, 94158, 94159, 94160, 94163

# **H&S 41955 Certification Required by Other Agencies**

41955. Prior to state board certification of a gasoline vapor control system pursuant to Section 41954, the manufacturer of the system shall submit the system to, or, if appropriate, the components

of the system as requested by, the Division of Measurement Standards of the Department of Food and Agriculture and the State Fire Marshal for their certification.

(Added by Stats. 1976, Ch. 1030.)

# **H&S 41956 Other Agencies to Adopt Rules for Certification**

41956. (a) As soon as possible after the effective date of this section, the State Fire Marshal and the Division of Measurement Standards, after consulting with the state board, shall adopt rules and regulations for the certification of gasoline vapor control systems and components thereof.

- (b) The State Fire Marshal shall be the only agency responsible for determining whether any component or system creates a fire hazard. The division shall be the only agency responsible for the measurement accuracy aspects, including gasoline recirculation of any component or system.
- (c) Within 120 days after the effective date of this subdivision, the Division of Measurement Standards, shall, after public hearing, adopt rules and regulations containing additional performance standards and standardized certification and compliance test procedures which are reasonable and necessary to prevent gasoline recirculation in systems for the control of gasoline vapors resulting from motor vehicle fueling operations.

(Amended by Stats. 1981, Ch. 902.)

## H&S 41956.1 Revision of Standards for Vapor Recovery Systems

41956.1. (a) Whenever the state board, the Division of Measurement Standards of the Department of Food and Agriculture, or the State Fire Marshal revises performance or certification standards or revokes a certification, any systems or any system components certified under procedures in effect prior to the adoption of revised standards or the revocation of the certification and installed prior to the effective date of the revised standards or revocation may continue to be used in gasoline marketing operations for a period of four years after the effective date of the revised standards or the revocation of the certification. However, all necessary repair or replacement parts or components shall be certified.

(b) Notwithstanding subdivision (a), whenever the State Fire

Marshal determines that a system or a system component creates a hazard to public health and welfare, the State Fire Marshal may prevent use of the particular system or component.

(c) Notwithstanding subdivision (a), the Division of Measurement Standards may prohibit the use of any system or any system component if it determines on the basis of test procedures adopted pursuant to subdivision (c) of Section 41956, that use of the system or component will result in gasoline recirculation.

(Amended by Stats. 1996, Ch. 426, Sec. 2.)

. References at the time of publication (see page iii):

Regulations: 17, CCR, section 94011

# **H&S 41957 Division of Industrial Safety Responsibilities**

41957. The Division of Occupational Safety and Health of the Department of Industrial Relations is the only agency responsible for determining whether any gasoline vapor control system, or component thereof, creates a safety hazard other than a fire hazard.

If the division determines that a system, or component thereof, creates a safety hazard other than a fire hazard, that system or component may not be used until the division has certified that the system or component, as the case may be, does not create that hazard.

The division, in consultation with the state board, shall adopt the necessary rules and regulations for the certification if the certification is required.

(Amended by Stats. 1981, Ch. 714.)

# H&S 41958 Rules Shall Allow for Flexibility in Design

41958. To the maximum extent practicable, the rules and regulations adopted pursuant to Sections 41956 and 41957 shall allow flexibility in the design of gasoline vapor control systems and their components. The rules and regulations shall set forth the performance standards as to safety and measurement accuracy and the minimum procedures to be followed in testing the system or component for compliance with the performance standards.

The State Fire Marshal, the Division of Occupational Safety and

Health, and the Division of Measurement Standards shall certify any system or component which complies with their adopted rules and regulations. Any one of the state agencies may certify a system or component on the basis of results of tests performed by any entity retained by the manufacturer of the system or component or by the state agency. The requirements for the certification of a system or component shall not require that it be tested, approved, or listed by any private entity, except that certification testing regarding recirculation of gasoline shall include testing by an independent testing laboratory.

(Amended by Stats. 1982, Ch. 466, Sec. 72.)

# **H&S 41959 Certification Testing**

41959. Certification testing of gasoline vapor control systems and their components by the state board, the State Fire Marshal, the Division of Measurement Standards, and the Division of Occupational Safety and Health may be conducted simultaneously.

(Amended by Stats. 1981, Ch. 714.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94010, 94011, 94012, 94013

# **H&S 41960 Certification by State Agencies Sufficient**

41960. (a) Certification of a gasoline vapor recovery system for safety and measurement accuracy by the State Fire Marshal and the Division of Measurement Standards and, if necessary, by the Division of Occupational Safety and Health shall permit its installation wherever required in the state, if the system is also certified by the state board.

(b) Except as otherwise provided in subdivision (g) of Section 41954, no local or regional authority shall prohibit the installation of a certified system without obtaining concurrence from the state agency responsible for the aspects of the system which the local or regional authority disapproves.

(Amended by Stats. 1996, Ch. 426, Sec. 3.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94011, 94012, 94013

# H&S 41960.1 Operation in Accordance with Standards

- 41960.1. (a) All vapor control systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be operated in accordance with the applicable standards established by the State Fire Marshal or the Division of Measurement Standards pursuant to Sections 41956 to 41958, inclusive.
- (b) When a seater or any authorized employee of the Division of Measurement Standards determines, on the basis of applicable test procedures of the division, adopted after public hearing, that an individual system or component for the control of gasoline vapors resulting from motor vehicle fueling operations does not meet the applicable standards established by the Division of Measurement Standards, he or she shall take the appropriate action specified in Section 12506 of the Business and Professions Code.
- (c) When a deputy State Fire Marshal or any authorized employee of a fire district or local or regional firefighting agency determines that a component of a system for the control of gasoline vapors resulting from motor vehicle fueling operations does not meet the applicable standards established by the State Fire Marshal, he or she shall mark the component "out of order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and either the component has been inspected by a representative of the agency employing the person originally marking the component, or the person using or permitting use of the component has been expressly authorized by the agency to use the component pending reinspection.

(Added by Stats. 1981, Ch. 902.)

# **H&S 41960.2 Maintenance of Installed Systems**

- 41960.2. (a) All installed systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be maintained in good working order in accordance with the manufacturer's specifications of the system certified pursuant to Section 41954.
- (b) Whenever a gasoline vapor recovery control system is repaired or rebuilt by someone other than the original manufacturer or its authorized representative, the person shall permanently affix a plate to the vapor recovery control system that identifies the repairer or rebuilder and specifies that only certified equipment was used. In

addition, a rebuilder of a vapor control system shall remove any identification of the original manufacturer if the removal does not affect the continued safety or performance of the vapor control system.

- (c) (1) The executive officer of the state board shall identify and list equipment defects in systems for the control of gasoline vapors resulting from motor vehicle fueling operations that substantially impair the effectiveness of the systems in reducing air contaminants. The defects shall be identified and listed for each certified system and shall be specified in the applicable certification documents for each system.
- (2) On or before January 1, 2001, and at least once every three years thereafter, the list required to be prepared pursuant to paragraph (1) shall be reviewed by the executive officer at a public workshop to determine whether the list requires an update to reflect changes in equipment technology or performance.
- (3) Notwithstanding the timeframes for the executive officer's review of the list, as specified in paragraph (2), the executive officer may initiate a public review of the list upon a written request that demonstrates, to the satisfaction of the executive officer, the need for such a review. If the executive officer determines that an update is required, the update shall be completed no later than 12 months after the date of the determination.
- (d) When a district determines that a component contains a defect specified pursuant to subdivision (c), the district shall mark the component "Out of Order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and the district has reinspected the component or has authorized use of the component pending reinspection.
- (e) Where a district determines that a component is not in good working order but does not contain a defect specified pursuant to subdivision (c), the district shall provide the operator with a notice specifying the basis on which the component is not in good working order. If, within seven days, the operator provides the district with adequate evidence that the component is in good working order, the operator shall not be subject to liability under this division.

(Amended by Stats. 1999, Ch. 501, Sec. 1.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94006, 94010, 94011

# H&S 41960.3 Telephone Number for Reporting Problems

41960.3. (a) Each district which requires the installation of systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall establish a toll free telephone number for use by the public in reporting problems experienced with the systems. Districts within an air basin or adjacent air basin may enter into a cooperative program to implement this requirement. All complaints received by a district shall be recorded on a standardized form which shall be established by the state board, in consultation with districts, the State Fire Marshal, and the Division of Measurement Standards in the Department of Food and Agriculture. The operating instructions required by Section 41960.4 shall be posted at all service stations at which systems for the control of gasoline vapors resulting from motor vehicle fueling operations are installed and shall include a prominent display of the toll free telephone number for complaints in the district in which the station is located.

(b) Upon receipt of each complaint, the district shall diligently either investigate the complaint or refer the complaint for investigation by the state or local agency which properly has jurisdiction over the primary subject of the complaint. When the investigation has been completed, the investigating agency shall take such remedial action as is appropriate and shall advise the complainant of the findings and disposition of the investigation. A copy of the complaint and response to the complaint shall be forwarded to the state board.

(Amended by Stats. 1986, Ch. 194, Sec. 1.)

# **H&S 41960.4 Operating Instructions**

41960.4. The operator of each service station utilizing a system for the control of gasoline vapors resulting from motor vehicle fueling operations shall conspicuously post operating instructions for the system in the gasoline dispensing area. The instructions shall clearly describe how to fuel vehicles correctly with vapor recovery nozzles utilized at the station and shall include a warning that repeated attempts to continue dispensing, after the system having indicated that the vehicle fuel tank is full, may result in spillage or recirculation of gasoline.

(Added by Stats. 1981, Ch. 902.)

## H&S 41960.5 Nozzle Size Requirements

41960.5. (a) No retailer, as defined in Section 20999 of the Business and Professions Code, shall allow the operation of any gasoline pump from which leaded gasoline is dispensed, or which is labeled as providing leaded gasoline, unless the pump is equipped with a nozzle spout meeting the required specifications for leaded gasoline nozzle spouts set forth in Title 40, Code of Federal Regulations, Section 80.22(f)(1).

(b) For the purpose of this section, "leaded gasoline" means gasoline which is produced with the use of any lead additive or which contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon.

(Added by Stats. 1987, Ch. 592, Sec. 2.)

## H&S 41960.6 Fuel Pump Nozzles

41960.6. (a) No retailer, as defined in subdivision (g) of Section 20999 of the Business and Professions Code, shall, on or after July 1, 1992, allow the operation of a pump, including any pump owned or operated by the state, or any county, city and county, or city, equipped with a nozzle from which gasoline or diesel fuel is dispensed, unless the nozzle is equipped with an operating hold open latch. Any hold open latch determined to be inoperative by the local fire marshal or district official shall be repaired or replaced by the retailer, within 48 hours after notification to the retailer of that determination, to avoid any applicable penalty or fine.

- (b) For purposes of this section, a "hold open latch" means any device which is an integral part of the nozzle and is manufactured specifically for the purpose of dispensing fuel without requiring the consumer's physical contact with the nozzle.
- (c) Subdivision (a) does not apply to nozzles at facilities which are primarily in operation to refuel marine vessels or aircraft.
- (d) Nothing in this section shall affect the current authority of any local fire marshal to establish and maintain fire safety provisions for his or her jurisdiction.

(Added by Stats. 1991, Ch. 468, Sec. 2.)

# **H&S 41961 Fees for Certification**

41961. The State Fire Marshal, the Division of Measurement Standards, and the Division of Occupational Safety and Health may charge a reasonable fee for certification of a gasoline vapor control system or a component thereof, not to exceed their respective estimated costs therefor. Payment of the fee may be made a condition of certification. All money collected by the State Fire Marshal pursuant to this section shall be deposited in the State Fire Marshal Licensing and Certification Fund established pursuant to Section 13137, and shall be available to the State Fire Marshal upon appropriation by the Legislature to carry out the purposes of this article.

(Amended by Stats. 1992, Ch. 306, Sec. 5. Effective January 1, 1993. Operative July 1, 1993, by Sec. 6 of Ch. 306.)

# H&S 41962 Vapor Recovery Systems on Cargo Tank Vehicles

- 41962. (a) Notwithstanding Section 34002 of the Vehicle Code, the state board shall adopt test procedures to determine the compliance of vapor recovery systems of cargo tanks on tank vehicles used to transport gasoline with vapor emission standards which are reasonable and necessary to achieve or maintain any applicable ambient air quality standard. The performance standards and test procedures adopted by the state board shall be consistent with the regulations adopted by the Commissioner of the California Highway Patrol and the State Fire Marshal pursuant to Division 14.7 (commencing with Section 34001) of the Vehicle Code.
- (b) The state board may test, or contract for testing, the vapor recovery system of any cargo tank of any tank vehicle used to transport gasoline. The state board shall certify the cargo tank vapor recovery system upon its determination that the system, if properly installed and maintained, will meet the requirements of subdivision (a). The state board shall enumerate the specifications used for issuing such certification. After a cargo tank vapor recovery system has been certified, if circumstances beyond control of the state board cause the system to no longer meet the required specifications, the certification may be revoked or modified.
- (c) Upon verification of certification pursuant to subdivision (b), which shall be done annually, the state board shall send a verified copy of the certification to the registered owner of the tank vehicle, which copy shall be retained in the tank vehicle as evidence of certification of its vapor recovery system. For each system certified,

the state board shall issue a nontransferable and nonremovable decal to be placed on the cargo tank where the decal can be readily seen.

- (d) With respect to any tank vehicle operated within a district, the state board, upon request of the district, shall send to the district, free of charge, a certified copy of the certification and test results of any cargo tank vapor recovery system on the tank vehicle.
- (e) The state board may contract with the Department of the California Highway Patrol to carry out the responsibilities imposed by subdivisions (b), (c), and (d).
- (f) The state board shall charge a reasonable fee for certification, not to exceed its estimated costs therefor. Payment of the fee shall be a condition of certification. The fees may be collected by the Department of the California Highway Patrol and deposited in the Motor Vehicle Account in the State Transportation Fund. The Department of the California Highway Patrol shall transfer to the Air Pollution Control Fund the amount of those fees necessary to reimburse the state board for the costs of administering the certification program.
- (g) No person shall operate, or allow the operation of, a tank vehicle transporting gasoline and required to have a vapor recovery system, unless the system thereon has been certified by the state board and is installed and maintained in compliance with the state board's requirements for certification. Tank vehicles used exclusively to service gasoline storage tanks which are not required to have gasoline vapor controls are exempt from the certification requirement.
- (h) Performance standards of any district for cargo tank vapor recovery systems on tank vehicles used to transport gasoline shall be identical with those adopted by the state board therefor and no district shall adopt test procedures for, or require certification of, cargo tank vapor recovery systems. No district may impose any fees on, or require any permit of, tank vehicles with vapor recovery systems. However, nothing in this section shall be construed to prohibit a district from inspecting and testing cargo tank vapor recovery systems on tank vehicles for the purposes of enforcing this section or any rule and regulation adopted thereunder that are applicable to such systems and to the loading and unloading of cargo tanks on tank vehicles.
- (i) The Legislature hereby declares that the purposes of this section regarding cargo tank vapor recovery systems on tank vehicles

are (1) to remove from the districts the authority to certify, except as specified in subdivision (b), such systems and to charge fees therefor, and (2) to grant such authority to the state board, which shall have the primary responsibility to assure that such systems are operated in compliance with its standards and procedures adopted pursuant to subdivision (a).

(Amended by Stats. 1982, Ch. 1255, Sec. 2. Operative July 1, 1983, or earlier, by Sec. 27.5 of Ch. 1255.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94014, 94015